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A TEXT BOOK

ON

PRESCRIPTION-WRITING

AND

PHARMACY

WITH

PRACTICE IN PRESCRIPTION-WRITING, LABORATORY EXERCISES IN PHARMACY

AND

A REFERENCE LIST OF THE OFFICIAL DRUGS

ESPECIALLY DESIGNED FOR MEDICAL STUDENTS

BY

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SECOND EDITION

THOROUGHLY REVISED AND ADAPTED TO THE EIGHTH (1905) EDITION OF THE UNITED STATES PHARMACOPOEIA

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PREFACE

The present volume represents the second edition of the "Laboratory Manual on Pharmacognosy, Pharmacy and Prescription-Writing" which was published in 1902. Increased experience has shown the desirability of having the medical student learn pharmacognosy alongside of pharmacology, the student's interest in the drug being more easily aroused when he studies its action and uses. Hence this course has been made to include only pharmacy and prescription-writing. It is hoped that this change may make the book more acceptable to other teachers of the subject.

The superiority of the laboratory method over mere theoretic instruction being generally conceded, it is hardly necessary to bring forth reasons for introducing it into the subject at hand. Indeed, we believe that the student cannot be taught properly in any other way.

The peculiar needs of the medical student have been continually kept in mind in deciding on what should be taken up, and what should be left out. Thus many details of paramount importance to the student of pharmacy have not been touched upon in this manual. It is not the aim of this course to make the student an expert apothecary. On the other hand, every practical point on prescription-writing available to the author has been introduced in its appropriate place, as the ultimate aim of this course is to teach the principles as well as the art of prescription-writing as thoroughly as possible.

It must be fully realized that prescription-writing is an art which like other arts can only be acquired by practice. It is not sufficient for the student to know the rules by heart; he must have practiced them sufficiently to be able to apply them

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trating the application of each of the rules as they are laid down. The instructor should correct and criticise these prescriptions.

The problems in prescription-writing introduced so abundantly in this book are intended to serve as exercises of the first grade. They are expected to teach the student the best form in which medicines may be prescribed. After the student has mastered this course, he should be introduced to problems of the second grade, in which he should be required to prescribe a certain drug or combination of drugs; leaving the choice of form, dose, and method of administration to the exercise of the student's knowledge and judgment. Finally, the student should be drilled in problems of a third grade, in which he is asked to prescribe for a certain condition of disease, for which he is to choose the proper medicament, which is then to be prescribed in the proper way. Thus, he advances by successive stages up to the point when he will be able to grapple successfully with the problems at the patient's bedside, when the element of diagnosis is added as a final complication. Is it a wonder that young practitioners who have not had the training just outlined find themselves hopelessly lost when they are faced by the necessity of writing a prescription at the bedside.

It is a well known fact that students as they issue from our medical schools are often sadly deficient in the art of prescription-writing. Unable, because untrained, to originate prescriptions that will best meet the needs of the case at hand, the young practitioner falls only too readily into the traps set for him by the proprietary medicine merchant. Ready-made "elegant" combinations are offered him under names that directly indicate their use. Shrewdly worded advertisements and oily-tongued drummers laud the virtues of the remedy to the skies. Soon the ease and ignorance with which these nostrums can be prescribed make the unwary and untrained physician the tool and sales-agent for wily manufacturers to the great detriment of his patient and the medical profession; for, leaving all other considerations aside, the ready-made prescription cannot possibly be made to fit the needs of the individual case of disease, even approximately, as easily as ready-made clothing can be made to fit the body of individual

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men. The root of this evil lies in lack of training in pharmacy and prescription-writing; and in a lack of knowledge and appreciation of our pharmacopœia.

In compiling this text-book, the author has consulted freely the following authoritative works: The United States Pharmacopœia (eighth decennial revision), with which this book has been brought thoroughly in accord; the National Formulary; the National Standard Dispensatory; the United States Dispensatory; Remington's Practice of Pharmacy; Scoville, the Art of Compounding; MacEwan, the Art of Dispensing; Ruddiman, Incompatibilities in Prescriptions; and the following books on prescription-writing: Gerrish, Mann, Curtis, Wall, Thornton, Neff, Colbeck & Chaplin. The 1905 editions of Wilcox's Materia Medica, Stevens' Modern Therapeutics, and H. C. Wood's Therapeutics have been of help in the revision of this book. Grateful acknowledgment is made of my indebtedness to these various sources.

BERNARD FANTUS, M. D.

443 Marshfield Ave., Chicago, Ill.

September 1st, 1905.

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CONTENTS.

PART I. PRESCRIPTION-WRITING.

PAGE

CHAPTER I. DEFINITIONS 1

CHAPTER II. FORM AND LANGUAGE OF PRESCRIPTIONS.. 5

1. Externals 5
2. Parts of Prescription..... 6
3. Language of Prescription-Writing..... 7
4. Grammatical Construction of Prescriptions..... 7
5. Latin Words and Phrases..... 8
6. The Names of Medicines..... 10
7. Formation of Genitive Case..... 12
8. Rules for the Use of Abbreviations..... 14
9. Rules for Pronunciation..... 15

CHAPTER III. THE DETERMINATION OF QUANTITIES..... 16

1. Weighing and Measuring..... 16
2. Weights and Measures..... 17
 A. The Old Systems..... 17
 B. The Metric System..... 18
 C. Equivalents of Metric and Common Systems..... 21
 D. Domestic Measures 22
3. Dosage 22
4. How to Determine Dose of Finished Product..... 27
5. Rules for Time and Frequency of Administration..... 29
6. How Much to Prescribe..... 30
7. Aids in Figuring on the Quantity of Ingredients..... 31

CHAPTER IV. THE COMPOSITION OF PRESCRIPTIONS..... 35

1. Method of Writing a Prescription..... 35
2. Choice of Ingredients..... 36
3. Pleasant Medication 40
4. Incompatibility 44
5. Directions to the Pharmacist..... 45
6. Directions to the Patient..... 45
7. Methods of Administration..... 46
 A. For Local Action..... 47
 (1). Upon Skin 47
 (2). Upon Mucous Membranes..... 48
 (3). Upon Parts Beneath the Surface..... 57

Digitized by Google

PAGE

B. Administration for General Action..... 58
(1). Oral Administration 58
(2). Rectal Administration 60
(3). Inhalation 61
(4). Epidermic Administration 61
(5). Endermic Administration 62
(6). Hypodermic Administration 63
(7). Intravenous Injection 65

CHAPTER V. PRESCRIPTION ETHICS..... 67
1. Prescribing of Placebos..... 67
2. Specifying in Prescriptions..... 67
3. Repeating of Prescriptions..... 69
4. The Ownership of the Prescription..... 70
5. The Cost of the Prescription..... 71

PART II. PHARMACY.

Order 1. Non-Extractive Liquid Preparations..... 73
Suborder A. Solutions..... 74
On Solution in General..... 74
Division 1. Aqueous Solutions..... 76
Class 1. Aquae. Waters 77
Class 2. Liquores. Solutions 79
Class 3. Syrupi. Syrups 83
Class 4. Mellita. Honeys 87
Class 5. Mucilagines. Mucilages 88
Division 2. Alcoholic Solutions..... 89
Class 1. Spiritus. Spirits 90
Class 2. Elixires. Elixirs 93
Division 3. Glycerin Solutions..... 95
Class 1. Glycerita. Glycerites 95
Suborder B. Suspensions..... 97
Class 1. Misturae. Mixtures 97
Class 2. Emulsa. Emulsions 99

Order 2. Extractive Preparations..... 104
Preparation of Vegetable Drugs for Use as Medicines..... 104
Suborder A. Liquid Extractive Preparations..... 110
Division 1. Aqueous Liquids..... 110
Class 1. Infusa. Infusions 110
Class 2. Decocta. Decoctions 112

Digitized by Google

PAGE

Division 3. Acetous Liquids 131
Class 1. Aceta. Vinegars 131
Division 4. Oily Liquids 132
Class 1. Oleoresinae. Oleoresins 132
Suborder B. Solid Extractive Preparations 133
Class 1. Extracta. Extracts 133
Class 2. Resinae. Resins 136

Order 3. Solid Preparations for Internal Use 137
Division 1. Powdered Substances 138
Class 1. Pulveres. Powders 138
Class 2. Triturationes. Triturations 143
Class 3. Oleosacchara. Oil-Sugars 145
Class 4. Pulveres Effervescentes. Effervescent Powders 145
Class 5. Species. Species 148
Division 2. Massed Substances 149
Class 1. Massae. Masses 149
Class 2. Confectiones. Confections 149
Division 3. Solid Dosage Forms 151
Class 1. Pilulae. Pills 151
Class 2. Trochisci. Troches 158
Class 3. Tabellae. Tablets 160
Class 4. Capsulae. Capsules 164
Class 5. Suppositoria. Suppositories 168

Order 4. External Preparations 172
Division 1. Liquid External Preparations 172
Class 1. Lotiones. Lotions 172
Class 2. Linimenta. Liniments 174
Class 3. Oleata. Oleates 176
Class 4. Collodia. Collodions 177
Class 5. Pigmenta. Pigments 178
Division 2. Semi-Solid External Preparations 179
Class 1. Unguenta. Ointments 179
Class 2. Cerata. Cerates 184
Class 3. Cataplasmata. Cataplasms 185
Division 3. Solid External Preparations 188
Class 1. Emplastra. Plasters 188
Class 2. Chartae. Papers 191
Class 3. Pulveres Adspersorii. Dusting Powders 191

PART III. REFERENCE LIST

Of Official Drugs and Their Preparations 193
APPENDIX. *Suggestions for Laboratory Exercises* 371
List of Laboratory Requisites 372

INDEX 376

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ABBREVIATIONS

U. S. P.—United States Pharmacopœia.
B. P.—British Pharmacopœia.
P. G.—Pharmacopœia Germanica.
N. F.—National Formulary.
Unoff.—Unofficial.
Gr.—Greek.
Lat.—Latin.
Eng.—English.
A. S.—Anglo-Saxon.
Syn.—Synonym.
Nom.—Nominative.
Gen.—Genitive.
Acc.—Accusative.
Pron.—Pronunciation.
Abbr.—Abbreviation.
Fr.—From.
F.—Female Gender.
M.—Male Gender.
N.—Neuter Gender.
Av.—Average.

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KEY TO THE PRONUNCIATION

Where the pronunciation has been given in full it **has been** placed in parenthesis and printed in Roman type. The phonetic method in use in Gould's Dictionary has been adopted, avoiding thereby in most instances the use of vexatious diacritic marks. **When a vowel is made to stand alone or at the end of a syllable, it has a long sound; when preceding, or between, consonants, the vowel has its short sound**; unless occasionally the use of the diacritic mark gives it a long sound. The syllabification has no significance except to show the pronunciation.

Whenever diacritic marks are used their meaning is as follows:

Ā long, as in fāte.	**Ă short, as in făt.**
Ē long, as in mēte.	**Ĕ short, as in mĕt.**
Ī long, as in īce.	**Ĭ short, as in pĭn.**
Ō long, as in nōte.	**Ŏ short, as in nŏt.**
Ū long, as in tūbe.	**Ŭ short, as in tŭb.**
Ȳ long, as in mȳ.	**Y̆ short, as in mY̆th.**

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A TEXT BOOK ON

PRESCRIPTION-WRITING AND PHARMACY

PART I.

PRESCRIPTION-WRITING.

CHAPTER I.

DEFINITIONS.

The word **prescription** (from Lat. *prae,* for; and *scribo,* I write), is generally defined as a written order for medicine sent by a physician to a pharmacist. In its broadest sense, it may be extended to mean not only an order for medicine, but also for exercise, diet, change of climate, indeed any remedy used in the treatment of disease. In this book we shall use the term in its popular meaning.

The proper meaning of the terms remedy, medicine, and drug should be clearly established. **Remedy** (from Lat. *re-*, again, and *mederi,* heal), is a term that refers to any agency used in the treatment of disease; including substances (or medicines) as well as forces, such as light, heat, electricity, etc., which latter might even be called non-medical remedies. **Medicine** (from Lat. *medicina,* from *mederi,* heal), is the term applied to any substance used as a remedy for disease. **Drug** (from A. S. *drugan,* to dry), formerly meant a dried medicinal plant; by extension it has been made to include any vegetable, animal, or mineral substance used in the composition or preparation of medicines. While the word drug, therefore, refers to the raw material, the term medicine is applied to the finished product of the druggist's art.

Drugs are not used in the raw state by civilized man any more than are foods. **Pharmacy** (from Gr. *pharmakeia,* the use of drugs, being derived from *pharmakon* which originally meant magic, later healing herb, still later equivalent to

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drug), is the word applied to the art of **preparing drugs for** use as medicines.

As the prescription is the common meeting ground for two different minds, that of the physician and that of the pharmacist, and in order to have a perfect understanding with a minimum loss of time and energy, it is necessary that both refer to the same standard for the names, the strength and purity of drugs, and the formulæ of medicines. This standard when issued by national authority is known as a **pharmacopœia** (from Gr. *pharmakon,* drug, and *poiein,* to make). It is a book which names, defines, and describes the most important and most commonly used drugs, gives tests for their purity and strength, and which contains formulæ for their preparations. By the term **preparations,** we understand those modifications of drugs that make them suitable for use as medicines. In most countries the **pharmacopœia** is published by the government; but in the United States, following the genius of our institutions, it is prepared by a committee of representative physicians and pharmacists, elected by recognized medical and pharmaceutic bodies.

The Pharmacopœia of the United States is revised every ten years in order to make it conform with the progress in medicine and in pharmacy. The present pharmacopœia, which is the eighth decennial revision (abbreviated U. S. P. VIII.), was prepared in the following manner: Delegates representing the Medical Department of the United States Army, the United States Navy, and the United States Marine Hospital Service, the incorporated State Medical and Pharmaceutic Associations, and the incorporated Colleges of Medicine and of Pharmacy, met in 1900 at Washington, D. C., constituting the United States Pharmacopœial Convention. This convention elected twenty-six of its members to constitute the Committee of Revision; and formulated certain general principles to be followed by the committee in revising the pharmacopœia. So great an amount of work had to be done by the committee, that it consumed almost five years in preparing the new pharmacopœia, which became official September 1st, 1905.

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possible to the prescribing of official substances and preparations, which should be designated by their full official name, so as to avoid the possibility of confusion; it is not necessary to add U. S. P. In ordering unofficial preparations, on the other hand, i. e., preparations not contained in the United States Pharmacopœia, it is necessary to mention the standard referred to. This is best done by appending the initials of the name of the standard work in which the formula may be found: e. g., B. P., for British Pharmacopœia; N. F., for National Formulary. The latter is an extremely useful collection of valuable unofficial formulæ published with the authority of the American Pharmaceutical Association. The antiquated term officinal (from Lat. *officina*, a workshop or laboratory), means anything kept in the apothecaries' shop, including official as well as unofficial drugs and preparations.

As the term **dispensatory** is occasionally referred to, the student should know that a dispensatory is a commentary on a pharmacopœia. It is a large reference work containing very full information not only on official drugs and preparations, but also on all other substances that physicians or pharmacists may hear about or have to deal with. It is a private publication, in this respect differing essentially from the pharmacopœia. Several dispensatories exist in this country; the United States Dispensatory and the National Standard Dispensatory being the ones most commonly used.

In the writing of a prescription at the patient's bedside, two separate and distinct problems present themselves. The first problem is, to choose the best remedy for the case at hand; the second problem is, to choose the best form in which to prescribe it.

To be able to choose the remedy, one must be well versed in materia medica, in pharmacology and in therapeutics. **Materia medica** (Lat. medical material), is the science which treats of the natural and commercial history of drugs, their physical and chemical properties, their preparations and dosage. **Pharmacology*** (from Gr. *pharmakon*, a drug, and *logos*, a dis-

*To be distinguished from pharmacognosy (from Gr. pharmakon, drug, and gnosis, knowledge), which is the art and science of the recognition of drugs and the determination of their quality. It is a study chiefly pursued by the pharmacist.

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course), is the study of the action of drugs. **Therapeutics** (from Gr. *therapeuein*, to attend upon), is the science and art of using remedies for the relief of disease.

This book deals mainly with the second problem, the choice of the form in which the remedy is to be prescribed. This is much simpler than the first; and definite rules may be laid down for the guidance of the prescriber. After the student has made himself perfectly familiar with these rules and their practice, he will be able to address himself to the more difficult question, the choice and combination of the remedy without having to worry much about so fundamental a matter as form.

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CHAPTER II.

THE FORM AND LANGUAGE OF PRESCRIPTIONS.

1. Externals.

The paper upon which a prescription is to be written is known as the prescription blank. It should be selected with the following points in view. It should be good, strong white paper, preferably linen paper: for a prescription often must bear a good deal of handling. A useful size is three and a half by five inches, as upon blanks of this width the writing is not likely to be too cramped. Prescription blanks should have printed upon them the physician's name, his residence and office address, his consultation hour, and his telephone number, so that the druggist may, if he desires, readily consult with the physician about the medicine intended. It is preferable not to have any druggist's advertisement upon the blank.

Pen and ink should invariably be used in prescription-writing. Pencil writing is less distinct, and liable to become blurred by frequent handling. Besides, a prescription is a document that may be of the greatest importance in medico-legal cases; and an unscrupulous druggist who has made a serious error in compounding might easily cause the chief blame to be placed upon the physician by erasing or modifying the pencil marks in such a manner as to conform with his mistake. For this reason, as well as for future reference, interleaved pads with copying paper are very desirable, as they enable the physician to retain an exact copy of the prescriptions given to his patients.

Legible handwriting is an absolute necessity. The proverbially

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accepted letters of the alphabet. The only way in which the pharmacist can retaliate for this imposition is by collecting the "best" specimens of this kind, and occasionally regaling his colleagues and others with the absurdities displayed. Beware of becoming in this manner the laughing stock of the druggist. What is still worse, serious and even fatal misinterpretations may occur. Prescription-writing is serious business; it does not pay to be in a hurry while writing a prescription.

2. *The Parts of a Prescription.*

Every prescription should consist of the following parts:

1. The **date** which is best given by writing first the name of the month, either in full or abbreviated, then the number of the day, and then the year; thus: Sept. 6, '05.

2. The **name of the patient** for whom it is designed, so as to avoid possibility of the wrong medicine being given to any one.

3. The **superscription,** indicated by the symbol R, standing for the Latin word *Recipe,* "take." It is addressed to the compounder. This symbol may conveniently be printed upon the prescription blank.

4. The **inscription,** expressing the name and quantities of the ingredients. **Each ingredient, with the quantity to be used, should be written upon a separate and distinct line.**

5. The **subscription** contains the instructions to the pharmacist. It declares the manner in which the ingredients shall be prepared before dispensing them to the patient.

6. The **transcription** (or signature) the desired labeling of the medicine, giving the directions to the patient, commonly preceded by the letter S., or the abbreviation Sig., standing for the Latin word *Signa,* "sign."

7. The **name of the prescriber** followed by "M. D.", to show that it has been written by a person authorized to prescribe.*

*Students in writing prescriptions for practice should sign their names; they must, however, not add "M.D." unless they have a right to the title. Such prescription will, of course, not be honored by a conscientious pharmacist.

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3. The Language of Prescription-Writing.

The **superscription, inscription and subscription being addressed to the pharmacist, are to be written in Latin,** for the following reasons: 1. The Latin names of drugs are more definite, concise, and unchangeable. 2. A Latin prescription can be understood and compounded by pharmacists all over the civilized world. 3. Because it is generally best to have the patient in ignorance as to the composition of the medicine he is taking. It is, of course, admissible to write the whole of the prescription in English, though it is not desirable for the reasons stated. Whatever language is used should be adhered to throughout this part without admixture of the other.

The **transcription, containing the directions to the patient, should be written in the language the patient understands.** It is the pharmacist's duty to transfer it literatim to the label on the medicine.

4. The Grammatical Construction of a Prescription.

As has already been stated, that part of the prescription addressed directly to the pharmacist is to be written in Latin, only a slight knowledge of which is necessary for this purpose. It involves the translating of very simple sentences, as will be seen from the following example:

Take	The superscription	to be rendered in Latin.
of potassium iodide, 10,0 Gm.	The inscription.	
of water, 100,0 Cc.		
Mix. Sign:	The subscription.	
"Teaspoonful in milk three times a day after meals."	The transcription, which is not to be translated.	

"Take" is translated into Latin *Recipe*, abbreviated "℞." The subject of this sentence (thou) it is as unnecessary to express in Latin as in English. ℞ **requires a direct object in the accusative case,** which in the above example, and in the great majority of all prescriptions,* is the quantity. While, in

*For exception to this, see article on prescribing of pills.

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Latin, the various cases are distinguished by the termination given to the root-word, an abbreviation or sign stands for any case of the Latin noun which it represents; hence the quantity will be written unchanged. **The names of the ingredients, modifying the quantity, are written in the genitive case**; thus the names of the ingredients must take the genitive ending. "Mix" translated into Latin is *Misce*, usually abbreviated "M." "Sign" is *Signa*, abbreviated "S." The prescription would therefore be written as follows:

℞

Potassii iodidi,	10,0 Gm.
Aquæ,	100,0 Cc.

M. S. Teaspoonful in milk three times a day after meals.

From this it will be seen that the knowledge of Latin necessary for the purposes of prescription-writing may be narrowed down to: first, certain words and phrases containing directions to the compounder; secondly, the names of medicines and their genitives.

5. *Latin Words and Phrases Used in Prescriptions.*

The directions to the pharmacist are in the great majority of cases very simple indeed. To translate these into Latin will require a knowledge of a few verbs, a few prepositions, a few phrases, and the Latin names of the various forms in which medicines are dispensed.

The verbs used in prescription-writing, giving directions to the compounder, are mostly in the imperative mood. If the object is expressed, it will be written in the accusative case, which is the analogue of the English "objective."

Recipe* (res'-ip-e). Symbol ℞*. Meaning Take.
Misce (mis'-e). Symbol M. Meaning Mix.
Signa (sig'-na). Symbol S. Meaning Mark.
Divide (div'-id-e). Abbrev. div. Meaning Divide.

*The dash at the end of the R standing for recipe is believed to

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Mitte (mit'-e). Meaning Send.
Pone (po'-ne). Meaning Put.
Extende (eks-ten'-de). Meaning Spread.

A few verbs are, however, in the subjunctive mood of mild command, taking the subject referred to in the nominative case.

Fiat (fi'-at), plural Fiant (fi'-ant), abbrev. Ft. Let be made.
Detur (det'-ur), plural Dentur (dent'-ur). Let be given.
Sufficiat (suf-ish'-e-at). May suffice.
Repetatur (rep-et-a'-tur). Let it be repeated.

The prepositions used in prescription-writing have the following meaning, and require the following cases:

Ad, meaning to, requires accusative.
In, meaning into, requires accusative.
Super, meaning upon, requires accusative.
Cum, meaning with, requires ablative.
Pro, meaning for, requires ablative.
Ana, abbrev. āā, meaning of each, requires genitive.

The following phrases are used:

Fiat mistura. Let a mixture be made.
Dividatur in partes aequales. Let it be divided into equal parts.
Dentur tales doses. Let such doses be given.
Quantum sufficiat, abbrev. q. s. As much as may be required.
Ne repetatur. Do not repeat.

The Latin names of the various forms of medicines will be studied in part II of this book.

In case complicated directions must be given to the pharmacist, it is better, even though incorrect, to use English in the subscription, for such directions may be incomprehensible to the average druggist in this country.

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6. *The Names of Medicines.*

The naming of medicines is one of the functions of a pharmacopœia. A vast amount of careful consideration, extending over many years, has been expended in perfecting a system of pharmacopœial nomenclature that is at once "brief, simple, expressive, distinctive, and convenient." The learning of these names and of their proper spelling constitutes an important part of the student's work. No one can hope to be considered even tolerably educated in his profession, unless he knows how to spell and pronounce properly its technical terms. The following general facts about official names will be of assistance to the student:

Drugs as well as medicines have an official Latin and an official English name, each to be used in its proper place. In English sentences use the English name; in the Latin sentences of prescriptions use the Latin name. Some medicines have, in addition, a synonym, i. e., an equivalent name in common use. Being generally antiquated and unscientific, synonyms should not be used; yet it is necessary for the student to be familiar with them in order to understand their meaning when they are used by others.

Whenever possible, only a single word is used in the official name. This word stands for the drug as defined by the pharmacopœia.

Thus, *Digitalis* stands for digitalis leaves; *Rheum*, for rhubarb root; *Conium*, for conium seed.

When, however, two parts of the same plant are official, they must be distinguished by affixing the Latin name of the particular part of the plant intended. Thus, *Belladonnae folia*, for the leaves of belladonna; *Belladonnae radix*, for the root of belladonna. It will be noted that, following the Latin idiom, the genitive precedes the noun it qualifies.

In case of salts, two words are needed in the official name, because a base may combine with many acids forming many different salts. The English title, e. g., *iodide of potassium*, is rendered according to the rule just laid down, *Potassii iodidum*.

An exception to this rule on the sequence of words occurs in the names of pharmaceutic preparations. Here, the name for

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the class of preparations precedes its genitive. Hence *tincture of opium* is *Tinctura opii;* not *Opii tinctura,* as it should be were the Latin idiom followed.

In the case of compound medicines, such official titles were selected that would express the composition as fully as possible, as in *Mistura rhei et sodae; Hydrargyrum cum creta; Tinctura opii camphorata.* When the number of important ingredients in a preparation is too great to admit of a selection, this is expressed by the adjective *compositus* (com-poz'-it-us), abbr. *comp.*, meaning compound.

When adjectives occur in an official title, they are put in their proper Latin place, i. e., adjectives follow the noun they modify. If the same noun is also modified by a genitive, this is inserted between the noun and its adjective. It must furthermore be remembered that adjectives agree with the noun they modify in gender, number, and case. Note that the gender of a Latin word depends generally on the termination, not the meaning. Nouns ending in *us* and *or* are usually masculine; those ending in *a* are usually feminine; those ending in *um* and *on* and indeclinable nouns are usually neuter. An exception to this rule occurs in the name of plants, which are usually feminine, even though their name ends in *us,* e. g., *Rhamnus purshiana, Prunus virginiana.* Adjectives change their terminations to conform to the gender of the noun. Thus we have: *Liquor iodi compositus,* (masculine); *Tinctura lavandulae composita,* (feminine); *Extractum colocynthidis compositum,* (neuter).

Nomenclature of acids. The hydracids are distinguished from the oxyacids by the prefix *hydro-;* examples: *Acidum hydrochloricum* for HCl; *Acidum sulphuricum* for H_2SO_4. To denote the various proportions of oxygen which an oxyacid may contain, the suffix *-icum,* (gen. *-ici*), English *-ic,* is used to designate the higher proportion of oxygen; and *-osum,* (gen. *-osi),* English *-ous,* to denote the lower; e. g., *Acidum sulphuricum* and *Acidum sulphurosum.* Still higher proportion of oxygen is designated by the prefix *per-* to the name of the "*-ic*" acid; still lower proportion by the prefix *hypo-* to the name of the "*-ous*" acid; e. g., *Acidum persulphuricum* and *Acidum hypophosphorosum.*

Nomenclature of salts. Binary compounds end in *-idum,*

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6. *The Names of Medicines.*

The naming of medicines is one of the functions of a ... macopœia. A vast amount of careful consideration, ex... ing over many years, has been expended in perfecting ... tem of pharmacopœial nomenclature that is at once "... simple, expressive, distinctive, and convenient." The lea... of these names and of their proper spelling constitutes an... portant part of the student's work. No one can hope ... considered even tolerably educated in his profession, unl... knows how to spell and pronounce properly its technical ... The following general facts about official names will be ... sistance to the student:

Drugs as well as medicines have an official Latin an... official English name, each to be used in its proper plac... English sentences use the English name: in the Latin sen... of prescriptions use the Latin name. Some medicines have ... dition, a synonym, i. e., an equivalent name in common us... ing generally antiquated and unscientific, synonyms shou... be used; yet it is necessary for the student to be familiar ... them in order to understand their meaning when they ar... by others.

Whenever possible, only a single word is used in the ... name. This word stands for the drug as defined by the ... macopœia.

Thus, *Digitalis* stands for digitalis leaves; *Rheum*, for ... barb root; *Conium*, for conium seed.

When, however, two parts of the same plant are o... they must be distinguished by affixing the Latin name ... particular part of the plant intended. Thus, *Belladonnae* ... for the leaves of belladonna; *Belladonnae radix*, for the ... of belladonna. It will be noted that, following the ... idiom, the genitive precedes the noun it qualifies.

In case of salts, two words are needed in the official ... because a base may combine with many acids forming ... The English title, e. g., *iodide of potas...*

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will end in *ii*,
root, there is

are indeclina-
eption: *Pepo*,
ng in *-o* take
; *Sapo*, gen.
y adding *-is*:
lis; *Sal*. gen.
that *Mel* and

ion make the
hur, gen. *Sul-*
considerable

ves by chang-
ns: *Asclepias*,

1).
ges. All salt-
en. *Sulphitis*.
as *Cantharis*.
which do not
ydrastis, *Sin-*

: *Calx*, *Calcis*;
anges in gen-

. *Lotionis*.
cilago, *Mucil-*

s, as *Alumen*,

those parts are
n the following
e radicis: *Po-*

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(gen. *-idi)*, English *-ide;* e. g., *Potassii bromidum,* for potassium bromide (KBr). Acids ending in *-ic* form salts ending in *-as* (gen. *-atis*), English *-ate;* e. g., *Sodii sulphas.* Acids ending in *-ous* form salts ending in *-is* (gen. *-itis*), English *-ite;* e. g., *Sodii sulphis.* When a metal forms more than one grade of compound with the same acid radicle, as iron does, forming *ferrous* and *ferric* compounds, this fact is ignored if but one of the compounds is used in medicine; thus ferric chloride is simply entitled *Ferri chloridum,* this being the only chloride of the metal recognized by the pharmacopœia. When both grades are used in medicine, either an old style of chemical nomenclature is followed, as in case of ferrous sulphate and ferric sulphate, which are named respectively *Ferri sulphas* and *Ferri tersulphas;* or an arbitrary descriptive title is adopted, as in case of mercurous chloride and mercuric chloride, the former being named "mild" (*Hydrargyri chloridum mite*), the latter "corrosive" (*Hydrargyri chloridum corrosivum*).

Nomenclature of proximate principles. The names of alkaloids end in *-ina* (gen. *-inae*), English *-ine;* e. g., *Morphina.* The names of glucosides and of neutral and bitter principles end in *-inum* (gen. *-ini*), English *-in;* e. g., *Elaterinum.*

7. *The Formation of the Genitive Case.*

In Latin, case is expressed by modification of the ending of words. Different endings require different modifications; in regard to which the following rules may be formulated:

Rule 1. Nouns ending in *-a,* form genitive in *-ae;* excepting those of Greek origin, (whose nominative ending is *-ma,* gen. *-atis*). Examples: *Quinina,* gen. *Quininae; Aqua,* gen. *Aquae.* On the other hand: *Rhizoma, Theobroma, Physostigma, Enema, Cataplasma,* and *Gargarisma,* change ending to *-atis,* as *theobromatis.* Note that *Folia* is plural, meaning leaves; and that its genitive is *foliorum.*

Rule 2. Nouns ending in *-us, -um, -on* form the genitive in *-i;* as *Acidum,* gen. *Acidi.* Exceptions: *Rhus,* gen. *Rhois; Limon,* gen. *Limonis; Erigeron,* gen. *Erigerontis.* The following

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when the root of the word ends in *i*, the genitive will end in *ii*, as *Sodium*, gen. *Sodii;* when there is no *i* in the root, there is only one *i* in the genitive, as *Ferrum*, gen. *Ferri.*

Rule 3. Most plant names ending in *-i, -o, -u, -l* are indeclinable; e. g., *Jaborandi, Kino, Buchu, Sumbul.* Exception: *Pepo*, gen. *Peponis.* On the other hand, chemicals ending in *-o* take genitive ending *-onis*, as *Carbo*, gen. *Carbonis; Sapo*, gen. *Saponis.* Chemicals ending in *-l* form genitive by adding *-is:* as *Chloral*, gen. *Chloralis; Alcohol*, gen. *Alcoholis; Sal.* gen. *Salis; Mel*, gen. *Mellis; Fel*, gen. *Fellis.* Note that *Mel* and *Fel* double the *l* in the genitive.

Rule 4. All other nouns of whatever termination make the genitive in *-s* or *-is;* as *Ether*, gen. *Aetheris; Sulphur*, gen. *Sulphuris; Aloe*, gen. *Aloes.* Certain words undergo considerable change in their termination.

Words, e. g. salt-names, ending in *-as* form genitives by changing to *-atis;* as *Sulphas*, gen. *Sulphatis.* Exceptions: *Asclepias*, gen. *Asclepiadis; Mas*, gen. *Maris.*

Words ending in *-ma* change *-a* to *atis* (see rule 1).

Words ending in *-is* may undergo various changes. All salt-names ending in *-is* change to *-itis*, as *Sulphis*, gen. *Sulphitis.* Other names ending in *-is* usually change to *-idis*, as *Cantharis*, gen. *Cantharidis*, excepting the following names which do not change in their genitive: *Digitalis, Cannabis, Hydrastis, Sinapis. Pulvis* has genitive *Pulveris.*

Words ending in *-x* change ending to *-cis*, e. g.: *Calx, Calcis; Nux, Nucis; Borax, Boracis; Pix, Picis. Cortex* changes in genitive to *Corticis.*

Words ending in *-io* change *-o* to *-onis*, as *Lotio, Lotionis.*

Words ending in *-go* change *-o* to *-inis*, as *Mucilago, Mucilaginis.*

Words ending in *-en* change in genitive to *-inis*, as *Alumen, Aluminis; Semen, Seminis.*

In forming genitives of compound names, only those parts are changed that are in the nominative; as is shown in the following examples: *Belladonnae radix*, gen. *Belladonnae radicis; Potassii iodidum*, gen. *Potassii iodidi; Tinctura iodi*, gen. *Tincturae iodi; Fluidextractum ergotae*, gen. *Fluidextracti ergotae.*

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8. *Rules for the Use of Abbreviations.*

Correct and careful abbreviations in prescriptions are permissible, and in certain respects even desirable. Thus by abbreviating such frequently used words as *misce* (*M.*), *signa* (*S.*), we save time and space, and render the prescription even more intelligible by bringing out more prominently its important parts. Another reason for abbreviating is that some of the official names are so long as to make it almost impossible to follow, without the use of abbreviations, the fundamental rule of writing each ingredient and its quantity on one line. Care must, however, be taken to abbreviate correctly, and to use no abbreviations that can possibly be misunderstood.

The following rule should be observed. **Drop the endings so that the last letter retained is a consonant which immediately precedes a vowel**; and place a period after the abbreviation; however, **no abbreviation is correct which would not allow us to recognize the word if it stood alone.** For example: *Hydrargyrum* may be abbreviated *Hydrargyr.* or *Hydrarg.* but not *Hydr.*, because this would not necessarily mean mercury. *Hydr.* might stand for *Hydras, Hydrargyrum, Hydrocyanicum, Hydrochloricum, Hydrobromicum, Hydriodicum.* Similarly *Chlor.* might mean *Chloral, Chloroformum, Chloretonum, Chlorum, Chloridum, Chloras; Sulph.* might be read as *Sulphur, Sulphidum, Sulphis, Sulphas.* **Hence all those words which have distinctive endings should be written in full**; as the names of chemicals, the names of plants, and of their active principles. Very short words, such as *Rheum, Opium,* should not be abbreviated.

The above rule does not dispense with the necessity of knowing the genitives; especially in certain words of the third declension; e. g. the genitive of *Pix* is *Picis*, of *Adeps. Adipis;* these would have to be abbreviated *Pic.* and *Adip.* respectively.

The more frequently a certain word is used in prescriptions the more advantageous will it be to abbreviate it. Thus the words and phrases used commonly in the subscription are very generally abbreviated. The names of the classes of official preparations are used so frequently that their correct abbreviations may very properly be used; as *Tinct.* for *Tinc-*

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tūra, Extr. for *Extractum.* Such words too as *Acidum, Oleum, Balsamum,* may well be abbreviated: *Acid., Ol., Bals.* Likewise is it convenient to use abbreviations for certain frequently used adjectives; as *comp.* for *compositus, -a, -um; dil.* for *dilutus, -a, -um; fluid.* for *fluidus, -a, -um.*

Never use abbreviations in reading or in speaking. In order to be able to read prescriptions correctly, the student must be able to supply the endings wherever they are omitted. It is therefore well that, in practicing prescription-writing in school, the student be required to write out all the words in full. The habit of using Latin abbreviations in English conversation; to say, for example: "I prescribed sod bicarb in aq menth pip," is not only inelegant but vulgar.

9. *Rules for Pronunciation.*

Following the English method of pronunciation of Latin names, the lettters have in general the same sounds as in the English.

Note the following special points:

1. A word has as many syllables as there are vowels and diphthongs; e. g., *Opium* (o'-pe-um), *Aetheris* (e'-ther-is).

2. In words of two syllables the accent is always on the first. Words of more than two syllables are accented on the penult if that is long in quality; otherwise, on the antepenult; e. g. *Conium* (ko-ni'-um), *Opium* (o'-pe-um).

Not to burden the student's mind with further rules which are never remembered when it is time to apply them, the pronunciation of the names of medicines is given in the "Reference List" (q. v.), using the phonetic method, as explained in the "Key to Pronunciation" (p. xii). The student is urged to use the reference list freely.

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CHAPTER III.

THE DETERMINATION OF QUANTITIES.

1. Weighing and Measuring.

Although weighing is capable of greater exactitude than measuring, it is obviously inapplicable in the dispensing of doses in the household. In prescribing dry preparations we can easily have the pharmacist put up each dose separately in various dosage forms, such as powder papers, pills, capsules, etc., thereby saving the patient or his attendants the necessity of measuring the doses, insuring greater accuracy. In case of liquid medicines, however, the final product is dispensed in a bottle from which the doses are measured out to the patient at the bedside. Since, therefore, liquid medicines are given to the patient by volume, it is well to **prescribe liquid ingredients by volume, while solids are prescribed by weight.** This is the universal custom in this country and it has a good deal to commend it.

In European countries fluids as well as solids are generally prescribed and compounded by weight. This practice introduces an inaccuracy on account of the different specific gravities of fluids, owing to which the same volume of different fluids has different weights. Thus, while 1 Cc. of water weighs 1 Gm., the same volume of oil weighs only 0.90 Gm., of glycerine 1.25 Gm., of syrups 1.33 Gm. Hence, in ordering a certain volume by weight this difference must be taken cognizance of; at least in case of the liquids just mentioned. In ordering oils we would have to write for one-tenth less; while in case of glycerine we would have to prescribe one-fourth more, and of syrups one-third more. But, of course, no such correction is necessary, if we follow above rule of prescribing liquids by volume and solids by weight.

In former times almost every country or state, even some

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lamentable state of affairs, the metric system was originated. This system was not the work of any one mind, nor of any one nation; although France has the honor of being the first to adopt it. Its use spread, until it has been adopted by scientists the world over, and by almost all enlightened nations, excepting the United States, Great Britain, and Russia. In the United States it has been accepted as the official system of the pharmacopœia. Still, through unjustifiable conservatism it is not yet generally used by the physicians and pharmacists of this country. For this reason the American student of today is obliged to learn several different systems of weights and measures; a hardship which it is hoped future generations will be spared by each and every one doing his best to secure the universal adoption of the metric system.

2. *Weights and Measures.*

(A) THE OLD SYSTEMS.

1. **Apothecaries' or Troy Weight.** (Used in Prescriptions.)

The grain (Lat. *granum*, sign *gr.**) is the unit. It was originally derived from "grain of wheat, well dried and gathered out of the middle of the ear." Note that *gr.* is also the proper abbreviation for the plural of *granum*, and not *grs.*, as the plural is *grana*, ending in *a*.

[Scruple (*scrupulus*)—sign ℈=20 grains.]
Drachm (*drachma*)—sign ʒ=60 grains
Troy ounce (*uncia*)—sign ℥= 8 drachms=480 grains.
[Troy pound (*libra*)—sign ℔.=12 ounces=5760 grains.]

Scruple and Troy pound have been placed in brackets because they are practically obsolete.

2. **Avoirdupois Weight.** (Used in Commerce.)

Pound (sign lb.) = 16 ounces =7000 grains.
1 ounce (sign oz.) =437½ grains.

3. **Apothecaries' or Wine Measure.** (Used in United States for both Prescription and Commercial Purposes.)

*The sign gr. should always be written with a small initial.

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Minim (sign ♏) is approximately equal to one drop, or to one grain of water.
(more exactly,= 0.95 grain.)
Fluidrachm (sign f3) =60 minims.
Fluidounce (sign f℥) =8 fluidrachms = 480 minims.
Pint (*Octarius;* sign O. or pt.)=16 fluidounces=7680 minims.
Quart (sign qt.) =2 pints.
Gallon (*Congius;* sign C. or gal.)=8 pints.

The Imperial Measure, the system of liquid measure used in Great Britain, differs essentially from ours in having twenty fluidounces to the pint, the fluidounce weighing 437½ grains. Care must be exercised not to confuse it with the American system, the fluidounce of which weighs 456.392 grains.

It will be seen that minim does not equal a grain; that there are two different ounces (designated by different abbreviations), neither of which is equivalent to the fluidounce. A pint is not a pound; and the pints of the two principal nations still using these systems are not identical. A comparative study of the metric system and the old systems seems all that is needed as argument in favor of the adoption of the former, and the speediest possible burial of the latter.

In order to avoid confusion with the metric system the following points should be observed in writing prescriptions in the old system:

1. **Quantities are written in Roman numerals.** A line is drawn over the top of the whole figure. Care should be taken to dot the ones (i) in each case to avoid mistakes in rapid writing (II for V). The last i may be tailed, thus j, but this is simply a flourish and really unnecessary. As there are no fractions in Roman numerals, **fractions have to be expressed in Arabic characters;** they are written as common fractions; gr. 1/10, not gr. 0.1. In prescriptions, ½ is written "ss" from Lat. *semissis,* meaning "a half."

2. **Signs are written before the quantity.** Thus gr. xviij,

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nations makes the name the *international system* more appropriate. It is also known as the *decimal system,* because multiples and subdivisions are obtained by ten (Lat. *decem*). The name *metric system* is derived from the fact that all the units are derived from the meter (Gr. *metron,* measure). It is very simple if the following fundamental facts are remembered. The units of the metric system are:

1. The Meter—(pron. mé-ter) abbr. *M.,* is the unit of length. It is the one-ten-millionth part of the distance from the earth's equator to the pole. It measures approximately 40 inches.

2. The Liter—(pron. lé-ter) abbr. *L.,* is the unit of capacity. It is a cube of a tenth of a meter (one cubic decimeter). It is a little more than a quart.

3. The Gram—(pron. gram) abbr. *Gm.,* is the unit of weight. It is the weight of a quantity of distilled water at its maximum density (4° C.) which fills the cube of the one-hundredth part of the meter (one cubic centimeter). It is approximately equivalent to fifteen grains.

These units are divided by prefixing the Greek numerals:

Deka—for ten times.
Hecto—for one hundred times.
Kilo—for one thousand times.

These units are divided by prefixing the Latin numerals:

Deci—for one-tenth.
Centi—one-hundredth.
Milli—for one-thousandth.

Not all of these terms are in practical use; and an understanding of the following few will be sufficient for our purposes in materia medica:

		ABBREVIATION		
For length,	centimeter	(cm.)	=	0,01 M.
	millimeter	(mm.)	=	0,001 M.
For weight,	kilogram	(Kg.)	=	1000,0 Gm.
	centigram	(cg.)	=	0,01 Gm.
	milligram	(mg.)	=	0,001 Gm.
For volume,	cubic centimeter*	(Cc.)	=	0,001 L.

* The term used instead of milli-liter. Note that in the above abbreviations capital initial letters are used for the units and their multiples, small letters for fractions of units.

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Indeed, in prescription-writing, the only units used are the *gram* and the *cubic centimeter*, which it will be seen by referring to the definition of the gram are equivalent to each other in case of aqueous liquids; differing of course in case of liquids of other specific gravity. Hence, if it is understood that we use grams for solids and cubic centimeters for liquids, the following form might be recommended for writing prescriptions in the metric system:

℞	Gm. vel Cc.
Hydrargyri chloridi corrosivi	0\|06
Potassii iodidi	20\|00
Syrupi sarsaparillæ compositi	60\|00
Aquae q.s. ad.	120\|00

The decimal line and the signs Gm. vel Cc. are preferably printed upon the prescription blank.

In writing in the metric system the following points should be observed, in order to avoid chances for error and misunderstanding:

1. **Quantities are written in Arabic numerals.**

2. **Fractional parts of the gram are always converted into decimal fractions,** in the writing of which a zero should precede the decimal point (as in the first line in above prescription).

3. The decimal point being so very important, and a dot being liable to dangerous complications inasmuch as a spot or a fly speck on the paper may increase or decrease the quantity ten times, it is well to **use a comma instead of a dot,** or, in prescription-writing, a decimal line placing grams on one side and fractions on the other side of the line similar to the use of a dollar and cents column.

4. In prescriptions **use the decimal point only to designate the gram and its fractions.** Thus, for instance, do not write "0,5 mg." as the sign for milligram might be misread gram which, of course, would be a serious error. To avoid the possibility of this, convert the amount into a fraction of the gram, or write out the denomination in full and use common fractions instead of decimal fractions. The above should, therefore be written 0,0005 Gm., or ½ milligram.

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5. **Signs are Written After the Quantity.** The abbreviation *Gm.* should be written with a capital *G* so as to avoid any possibility of mistaking it for *gr.*, the sign for grain.

In reading quantities including several denominations, only one unit is used: thus, 0,065 Gm. is read 65 milligrams, not 6½ centigram, nor sixty-five thousandth of a gram. This corresponds exactly with the method of using the terms of our United States money, namely the dollar corresponding to the gram, the cent (or centi-dollar) to the centigram, and the mill (milli-dollar) to the milligram. Thus, as $0.06 would be read 6 cents, so 0,06 Gm. is read 6 centigrams.

(c) EQUIVALENTS OF METRIC AND COMMON SYSTEMS.

The following approximate equivalents have been selected for the special purpose of furnishing a ready method of translation, that can be easily memorized, that will give well rounded figures, and yet will be sufficiently accurate for practical purposes of prescription-writing; the more exact figures are given to show amount of error.

Conversion of Common into Metric System:

gr i is about 0,06 Gm., more exactly 0,065 Gm.
ʒ i is about 4,00 Gm., more exactly 3,9 Gm.
℥ i is about 30,00 Gm., more exactly 31,1 Gm.
lb. i (av.) is about 500,00 Gm., more exactly 453,6 Gm.

Conversion of Metric into Common System:

1 mg. is about gr. 1/60, more exactly gr. 1/64.
1 Gm. is about gr. xv, more exactly gr. xv 2/5.
1 Kg. is about lb. ii, more exactly lb. ii 1/5. (av.)

In changing fluid measures, we may employ the same equivalents to get results accurate enough for all practical purposes, thus:

1Cc. is about ♏ xv, more exactly ♏ xvi.
1 L. is about O ii, more exactly O ii 1/10.

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(D) DOMESTIC MEASURES.

On account of the ignorance of the average layman in regard to the official weights and measures, it is customary to direct our patients to employ for the administration of medicines some domestic measure, with which they are acquainted.

As all of these measures are very variable, it would be extremely desirable to have these unreliable domestic measures replaced by graduated medicine glasses.

Table of Equivalents of Domestic Measures.

1 drop (1 gtt. Lat. *gutta*)	is about ♏ i,*	metric	0,05 Cc.
1 teaspoonful	is about ʒ i,	metric	4,0 Cc.
1 dessertspoonful	is about ʒ ii,	metric	8,0 Cc.
1 tablespoonful	is about ʒ iv,	metric	16,0 Cc.
1 wineglassful	is about ℥ ii,	metric	60,0 Cc.
1 teacupful	is about ℥ iv,	metric	120,0 Cc.
1 tumblerful	is about ℥ viij,	metric	240,0 Cc.
1 knifepointful	is about gr. xv to xxx,	1,0 to 2,0	Gm.

3. Dosage.

The dose of a medicine is the quantity advisable to administer. The determination of the proper dose is almost as important as the selection of the proper remedy, for very often an error in dosage will cause failure of the remedy. Many remedies act very differently in different doses; a very small dose sometimes having exactly the opposite effect from that of a large one. The present pharmacopœia gives in connection with each article that is likely to be used internally the average dose for adults, which is quoted in the "Reference List." These doses must not be regarded obligatory; they are merely intended as a guide to those unfamiliar with the drug or preparation. A physician may give less or more, according to his judgment; for the dose of a remedy must be varied in the same manner that the cut of a coat must be varied to fit each individual.

*As a matter of fact, the size of a drop varies greatly according to the nature of the fluid and of the lip from which it is dropped. There may be from 20 to 50 drops to 1 Cc.

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The physiologic dose is that amount which will produce slight but distinct symptoms in a normal individual; it is generally stated as the maximum dose in the text-books. When giving a powerful remedy to a patient for the first time it is better to begin with a smaller dose, the initial or minimum dose, unless the urgency of the case demands that a large dose should be given. Cases occur when the "maximum dose" of the text-books is exceeded with positive benefit to the patient. The only dose that should not be exceeded or only exceptionally and with the greatest caution, is the minimum fatal dose, which is the smallest quantity known to have produced death in a human being. A toxic dose is one capable of producing marked derangement of the functions of the body.

The learning of these doses always seems one of the most formidable tasks to medical students. To lighten it, we would recommend that the student divide all drugs into three classes: poisonous, powerful, and non-poisonous. By learning in addition the generalizations given on the dosage of the various preparations (in part 2,) the student should have little difficulty in remembering doses. For instance: belladonna is a poisonous drug; its tincture is therefore given in doses of 0,5 to 1,0 Cc., which is the dose of most tinctures of poisonous drugs.

The dose given in the text-books is considered proper for adult males in the prime of life, the medicament unless otherwise specified to be given by the mouth. There are many conditions that necessitate modifications of this dose, which may be mentioned as follows:

1. **Age and sex.** The same amount of drug distributed through the tissues of a very large individual must receive a greater dilution, hence have less effect than if distributed through the tissues of a very small individual. Thus the dose is very nearly proportional to the weight, although in such calculations the weight of adipose tissue would have to be deducted, for fat is an inert tissue and does not count; similarly allowance would have to be made for dropsies. Women usually require smaller doses than men, not only because they are generally smaller but also more sensitive than men.

The difference between the weight of the child and of the adult is very great. Partly for this reason, and partly because certain tissues are more susceptible in the child, the necessity

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arises for a very careful adjustment of the dose in case of children. The dose for a child may generally be calculated by means of Brunton's modification of **Cowling's rule**, which is probably the most convenient one for prescribing in the metric system. **This rule takes the adult age as 25, and reckons each year which the child has commenced as an even part of 25.** Thus for a child which is four years old and has commenced its fifth year, the dose would be 5/25=1/5 of the adult dose. The convenience of this plan is the ease with which 25 can be converted into 100, and with which division by 100 can be effected. Let us figure, as an example, on the quantity of quinine wanted for a child of seven. Assuming the dose for an adult to be 0,5 Gm., the dose for this child which has commenced its eighth year is $\frac{0,5\times 8}{25}$=4/25 Gm.; but instead of dividing by 25, we can multiply both the numerator and denominator by 4, thus: $\frac{4\times 4}{25\times 4}=\frac{16}{100}$=0,16 Gm.

Young's rule, which is more convenient for prescribing in the old system, takes **the fraction obtained by dividing the age by the age plus 12** as the proportion of the adult dose required. Thus for a child of four years the dose would be: 4 divided by 4 plus 12=4/16=1/4 of the adult dose.

All of these arbitrary formulæ require, however, modification in case of certain drugs; thus children are very susceptible to opium, which must be given in doses much smaller than those of the formula; while arsenic, belladonna, and purgatives are usually well borne by children and relatively large doses of these drugs can be prescribed.

As old age approaches, it is advised to again reduce the dose somewhat, and to give to individuals from 70-80 years of age about 3/4 of the adult dose; after 85, about 1/2. There are exceptions to this rule, also; for old people generally bear opium and stimulants very well, and often need large doses of purgatives.

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knowledge of the constitution" is necessary. A knowledge which can only be gained by experience, and for the acquisition of which obviously but little help can be given by generalizations. Still, some of the factors may be pointed out which go to make up "the constitution."

It is the knowledge of hereditary tendencies that makes the advice of the old family physician sometimes so valuable. The habits of life are of importance. Hard physical work and habitual exposure to weather render the system less sensitive; refinement, luxury, and indolence more sensitive to disturbing agencies. Thus, a laboring man may have to receive twice the dose that would be sufficient for a professional man.

Habituation to drugs is another factor that must always be reckoned with. The human system has a remarkable power of acquiring tolerance to the influence of certain drugs, so that progressively larger doses have to be given to obtain the same effect. This renders an alcoholic peculiarly unsusceptible to the influence of alcohol and of closely allied agencies such as chloral, or sulphonal; an opium habitue may require several times that dose of opiate which would be fatal to an ordinary individual. This also explains the reason why a drug that acts well at first, often loses its effect after awhile; and why in the treatment of chronic diseases it often becomes necessary to substitute one remedy for another of the same class, in order to obtain renewed benefit; such remedies that are interchangeable are termed *succedanea*. An extensive range of succedanea in the possession of the physician greatly increases his resources.

Temperaments, or the peculiarities of classes of individuals, have to be taken into account. Individuals of the nervous temperament generally require smaller doses than a phlegmatic person. Idiosyncrasies, the peculiarities of individuals, cannot be known except as the result of experience. Idiosyncrasy may show itself as an exceptional indifference, an exceptional susceptibility, or an exceptional mode of reaction; and it occurs not only in relation to drugs but also to foods. It is expressed in the old saying: "One man's meat is another man's poison." It must be admitted, however, that calling such exceptional reactions idiosyncrasy is merely substituting a well-sounding word for our ignorance, using a cloak for our inability to explain matters. A well-defined idiosyncrasy should challenge us to endeavors to

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determine the cause. Thus intolerance to drugs should furnish a strong hint to investigate the condition of the kidney; it may be due to cumulative action, i. e., greater absorption than excretion, hence accumulation of the drug in the system. An exceptional mode of reaction may be due to greater prominence in the individual of certain well-defined side actions of drugs (untoward effects), which in others would occur only as a result of excessively large doses.

3. **Temporary conditions** are likewise of importance. The time of administration modifies the action of drugs. Thus a full stomach delays general and lessens local action. A smaller dose of an agent will produce an action when it is given so that its effect would coincide with the natural time of that action than when it is given out of season. Hypnotics are most efficient in the evening; purgatives should be administered so as to act at the accustomed time of evacuation. During menstruation, certain remedies have a special action. Thus purgatives tend to increase the flow. At this time it is wise to use all very active drugs with special care, or abandon them temporarily. During pregnancy, powerful purgatives may cause abortion. During pregnancy, as well as during lactation, we must always bear in mind the action which the drug will have upon the child, for at these times many drugs pass from mother to child. It is extremely probable that emotions influence the activity of drugs, favoring or hindering their action, and the physician who fails to avail himself in disease of the "expectant attention" drops a most important article out of his list of remedial agents.

4. **Disease** exerts a most profound influence upon the action of remedies. Thus remedies that directly antagonize a disease or disorder are generally well borne and required in large doses; while at other times the action of a remedy may be increased to an unexpected extent by the presence in the body of an agency acting in the same direction. Certain remedies produce a characteristic effect in disease which is not obtained in health; for example, the antipyretics reduce the temperature in fever, but have no effect on it in health. While, again, other remedies which have a certain action on normal tissues may fail to pro-

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unable to dilate sclerotic vessels. Local disease may contraindicate a remedy otherwise indicated; for instance, gastro-intestinal irritation contraindicates most of the tonics, bitters, iron preparations; congestion or irritation of bladder or of middle ear would contraindicate quinine.

5. **The remedy,** especially the method of its administration, requires modification of dose; thus the hypodermic dose is generally one-half, the rectal dose twice the dose per mouth. Combination with another remedy having the same effect in the body (synergist) lessens the dose necessary of each.

When an **unusually large dose** of a dangerous remedy is prescribed, as of morphine for a morphine habitue, it should be marked in some way to show that such a dose is intended, and not written by error. Probably the best way of doing this is to write the quantity both in numerals and in words, the latter either in English or in Latin, in parenthesis, as in the following example:

℞
Morphinæ sulphatis, 0,25 Gm. (twenty-five centigrams).
Sacchari lactis, 0,50 Gm.
M. et divide in chartulas V. (five).
S.: One powder every four hours as needed.

It may be well to write, in addition, at the bottom of the prescription: "The above is just as intended." All this should be done to avoid delay, as a careful pharmacist may hesitate to put up such a prescription without consulting the physician about it. Such hesitation is entirely justifiable, for the pharmacist is held criminally liable with the physician if he compounds or dispenses a prescription containing a fatal dose of poison. This serves as a valuable safeguard against mistakes in prescribing.

4. *How to Determine the Dose of the Finished Product.*

On account of greater convenience to the patient, as well as greater accuracy and uniformity of dosage, **prescribe liquid medicines by the spoonful rather than by the drop**; except when we have to feel our way to the maximum dose the patient will bear, in which case we commence with a few drops of the rem-

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edy, increasing the dose by one or more drops daily until a certain effect is produced, (ascending dose).

On the other hand, be careful not to make the bulk of the prescription too large, but rather order the dose to be diluted at the time of its administration. If the medicine is directed to be taken in water or milk, the concentration of solution is only limited by solubility; and **upon the solubility of the ingredients depends the size of the dose,** teaspoonful, dessertspoonful, or tablespoon. If the medicine is not diluted at the time of taking, a teaspoonful should not carry more than 0,30 Gm. of a solid, unless it is very bland; for concentrated salt solutions are irritant.

Practice in Prescription-Writing.

PROBLEM 1. Write prescription for 20 doses of solution of potassium arsenite; five drops to be given three times daily after meals; for case of chronic neuralgia.

PROBLEM 2. Write prescription for solution of potassium arsenite in ascending doses, from five drops to fifteen; for case of chorea.

PROBLEM 3. Write prescription for 30 doses of potassium iodide 0,5 Gm. in equal parts of syrup of orange and of peppermint water; to be taken in water three times daily, after meals; for case of arterio-sclerosis.

PROBLEM 4. Antisyphilitic. Write prescription for 60 Cc. of solution of potassium iodide of such concentration that 1 Cc. of solution=1 Gm. of salt. Directions: 10 drops in milk three times daily after meals; increase each dose by one drop daily up to 30 drops.

PROBLEM 5. Write prescription for rhubarb and soda mixture for chronic dyspepsia. This celebrated mixture contains:

Sodium bicarbonate*	1,0 Gm.
Fluid extract of rhubarb Spirit of peppermint, of each	0,5 Gm.

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5. *Rules for Time and Frequency of Administration*

Before we can determine how much to prescribe we must decide on the proper time and frequency of administration. This depends upon whether local or general effect is desired; whether sustained and continued or only a single prompt impression is to be made on the system; and finally on the rapidity and duration of action of the remedy.

1. **For Local Action.** (*a*) **On Mouth and Throat.** The use of the remedy must be repeated quite frequently, every hour or oftener, as the remedial agent does not stay long in the mouth. Do not use food or drink immediately after such local application.

(*b*) **On Stomach.** Introduce remedy when stomach is empty, which is usually the case half to one hour before meals. If the remedy is to act on the contents of the stomach, it would be given immediately before, during or after meals, according to whether its action is wanted during the early (amylolytic) period of gastric digestion, or during the later (proteolytic) period.

(c) **On Intestine.** Give two or three hours after meals, when the contents of the stomach are being emptied into the duodenum. If the stomach is not at all to be acted on, we may give the remedy in form of a hard pill, or better enclosed in double gelatin capsules, i. e., one gelatin capsule within another, or else we may make use of especially coated "intestinal" pills (q. v.)

(*d*) **Rectal or Urethral** applications are best made after an evacuation of the bowel or bladder.

2. **For General Action.** (*a*) **If a single prompt impression is desired,** the remedy is best given in solution, on an empty stomach, and is made mildly irritating and hot, for absorption is more rapid in the presence of heat and mild irritation. Hypodermic injection or inhalation gives prompter results; intravenous injection promptest. Give the remedy with due reference to the rapidity of its action. Thus, rapidly acting cathartics are given in the morning, slowly acting cathartics are given at night, so that, in neither case, the patient's sleep be disturbed by the action of the remedy.

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(*b*) **If continued action is desired,** the remedy is generally best given three times a day after meals, when by reason of the fullness of the stomach it is very much diluted so as to be least irritant to the stomach and absorbed slowly and more continuously. Substances that interfere with gastric digestion should, however, not be taken until 2 to 3 hours after meals. Agents that have a very fleeting effect may have to be taken oftener than three times a day, even every half hour; while substances that have very enduring action need not be taken oftener than once or twice a day.

6. *How Much to Prescribe.*

Having decided on the time and frequency of administration, the next question that arises is to determine the total number of doses to be prescribed. For this purpose we must find the number of doses to be taken in a day, and decide on the number of days the medicine is to last.

Rule for finding the number of doses in a day. Divide sixteen by the number of hours of interval between the administration of the separate doses, and add one. Thus, if the patient take a dose of medicine every three hours, he will take six doses ($16 \div 3 = 5$; $5 + 1 = 6$) in one day. In such calculations we, of course, ignore fractions. We figure on sixteen hours a day, as the other eight hours are taken up by sleep. It is seldom necessary to rouse a patient to take medicine, as sleep is generally of as much importance as drugs.

In determining the number of days the medicine is to last, it should be borne in mind, that we should rather err in prescribing too small than too large a quantity. It is far better to have the prescription repeated over and over again than to risk having half a bottle set aside unused. Patients will rarely complain of the cost of medicines that are taken; but they will observe the waste and criticise you when you set aside one half-used remedy and prescribe another. Hence it is a wise rule to

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is needed, it may save expense and trouble if a larger quantity is ordered at a time.

Multiplying the number of doses per day by the number of days the medicine is to last, we obtain the total number of doses. This figure should now be modified and rounded out, if necessary, to conform to the system of weights used; the multiples or convenient subdivisions of ten for the metric system, of twelve for the old system. This greatly facilitates the further calculations.

In prescribing liquids we should aim to obey the rule that **the prescribed medicine should just fill a bottle.** It looks better. Hence we must know the various sizes of medicine bottles carried in stock by our druggists; they range as follows: 1, 2, and 4 fluidrachms, 1, 2, 3, 4, 6, 8, 12, 16, and 32 fluidounces. It is very much to be regretted that the druggists of this country do not carry a stock of metric medicine bottles. It is true that it would be somewhat of a hardship for the average druggist to keep two complete assortments of bottles on hand.

Practice in Prescription Writing.

PROBLEM 6. Write prescription for potassium bromide, 1,0 Gm. in aromatic elixir to be taken in a little water every hour until quiet, for case of excessive display of grief on hearing bad news.

PROBLEM 7. Write prescription for potassium bromide, 2,0 Gm. to be taken in tumblerful of milk three times daily after meals for case of epilepsy. In this disease bromide has to be taken for years.

7. Aids in Figuring on the Quantity of Ingredients.

To obtain the quantity of each ingredient in a prescription, **multiply the intended dose by the total number of doses.** There is no difficulty in computing the amounts, if the total number of doses conforms to the system of weights; if, for instance, when prescribing in the metric system, the total number of doses be ten or its multiples.

It is not necessary to ascertain the amount of vehicle needed, if we direct the druggist to use a sufficient quantity of the ve-

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hicle to make up the total volume desired; this is expressed in Latin by the phrase *quantum sufficiat ad,** abbreviated *q. s. ad,* meaning "the quantity that may suffice for," which is then followed by the figure expressing the total volume. If, for instance, we desire to prescribe 10 doses of 1 Gm. of potassium bromide with aromatic elixir as the vehicle; and we decide that a teaspoonful is to be the dose of the finished product, we write as follows:

℞	Gm. vel Cc.
Potassii bromidi,	10,0
Elixiris aromatici, q. s. ad	40,0

M. S. Teaspoonful in water every two hours.

Had the *q. s. ad* been omitted in above prescription, the volume of the finished product would have exceeded 40 Cc., as the dissolved salt occupies some space; and consequently each teaspoonful would have contained less than the desired amount.

In case of liquid medicines, the prescriber in the metric system meets with a complication arising from the fact that druggists generally do not carry in stock metric prescription bottles; their stock bottles conforming to the old system. If we are to follow the rule to have the prescribed mixture aggregate just a bottleful, the number of doses we have to prescribe is generally not convenient for figuring in the metric system. One way of overcoming this difficulty would be to disregard the last mentioned rule, and to prescribe 50, 100, etc., Cc. mixtures; and let the druggist dispense them as best he can. Thus, for a time our patients would obtain only partially filled medicine bottles; but after a while the druggists would find it to their advantage to carry in stock metric prescription bottles also.

Another quite convenient, and sufficiently accurate way of meeting the difficulty just indicated, is to assume that there are **15 doses of a teaspoonful each in a 2 ounce mixture, 30 in a 4 ounce mixture, and 60 in an 8 ounce mixture.** If the dose is

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a tablespoonful there will be only one-fourth as many doses; if a dessertspoonful, one-half as many doses. Now, 15, 30, 60 lend themselves readily to calculations in the metric system.

For those who have learned the doses of medicines in the old system, and who desire to write metric prescriptions, the application of the same assumption permits the following exceedingly convenient rule to be formulated: **Substituting for the number of grains or minims of the dose the same number of grams or cubic-centimeters will give 15 doses in metric terms.** This rule is approximately correct, as 1 gram or cubic-centimeter equals approximately 15 grains or minims. By this rule we are enabled to prescribe without any difficulty an ordinary bottleful, as 60 Cc. (15 doses of 60 minims, or a teaspoonful) or 240 Cc. (15 doses of 240 minims, or a tablespoonful) will fill a 2 or an 8 ounce bottle respectively.

For prescribing liquid medicines in the old system, the following rule based on the same assumption is of aid: **For an 8 ounce mixture, the dose being a teaspoonful, take as many drachms of the ingredients as there are wanted grains or minims to the dose.** Reason: An 8 ounce mixture contains 60 teaspoonful doses; and 1 drachm equals 60 grains. For 4 ounce mixtures, one-half as many drachms would be used; for 2 ounce mixtures, one-fourth as many; while if the dose be a tablespoonful we would prescribe one-fourth as many drachms, as there are only one-fourth as many doses.

To compute the strength of "per cent" solutions the metric system is exceedingly convenient. To facilitate figuring, if the old system is used, we may assume that the ounce contains 500 minims or grains; the pound, 7,000 grains; the pint, 7,500 minims.

Practice in Prescription-Writing.

PROBLEM 8. Hypnotic. Fifteen doses of chloral 0,3 Gm. and potassium bromide 0,6 Gm. in aqueous solution flavored with syrup of orange. Teaspoonful in water to be taken at bed-time; and repeated in half hour if necessary.

PROBLEM 9. Stomachic in dyspepsia; hydrochloric acid deficiency. Write prescription for 30 doses of diluted hydrochloric acid 1 Cc.: with water enough to make a teaspoonful to

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be taken in ½ tumblerful of water through glass tube after each meal.

PROBLEM 10. Hematinic tonic. Solution of iron and ammonium acetate. Tablespoonful to be taken three times daily after meals. Prescribe 15 doses.

PROBLEM 11. Mouth wash for ulcerated mouth. Prescribe half saturated solution of potassium chlorate with 25 per cent glycerin. Give directions to use two tablespoonfuls three times a day as gargle.

PROBLEM 12. Nasal injection in ozena. Prescribe 250,0 Cc. of compound solution of iodine diluted with water to make the liquid contain 1 part of iodine in 1000. Give directions to use as nasal injection.

PROBLEM 13. Diuretic. Fifteen doses of potassium acetate, 10 grains; spirit of juniper, 15 minims; spirit of nitrous ether, 30 minims; decoction of scoparins, enough for 1 tablespoonful. Dose in tumblerful of water four times a day. Write one prescription, using old system of weights and measures; and one prescription, using metric system.

PROBLEM 14. For irritative dyspepsia. Sixty doses of diluted hydrocyanic acid, 1/2 minim; bismuth subnitrate, 1 grain; syrup of orange, 8 minims; infusion of gentian, enough for teaspoonful. Dose to be taken three times a day before meals. Write both in old and in metric system.

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CHAPTER IV.

THE COMPOSITION OF PRESCRIPTIONS.

1. Method of Writing a Prescription.

Never carry to a patient a ready-written prescription, as if copied from some book; rather commit it to memory, or jot it down in your visiting list to be glanced at in the proper moment.

Write the prescription deliberately but without hesitation. Avoid the necessity of re-writing a prescription; for if the physician begins two or three prescriptions before finishing one, it gives the patient the impression that the physician is undecided in regard to the proper treatment. Therefore, do not commence writing the prescription until you have finished the examination of the patient and made the diagnosis. Nothing is more likely to destroy the confidence of the patient than if the physician commences to write a prescription and then throws it aside, half finished, upon hearing the patient state a symptom not before mentioned.

Do not converse with the patient while writing the prescription. If the patient addresses a remark to you at this time, ask him politely to wait until you have finished the prescription.

Having written date, name of patient, and ℞, the steps are:

1. Choice of the ingredients; to be discussed below.
2. Search for incompatibility; to be discussed below.
3. Directions to the pharmacist; to be discussed below.
4. Directions to the patient; to be discussed below.
5. The quantity of the ingredients, which is determined by multiplying the dose of each ingredient by the total number of doses. Put down the quantity thus obtained in the same line with the ingredient.

This order of writing the prescription possesses the liability of the so-called "error of transposition," which consists in placing the quantity intended for one ingredient opposite another, and vice versa. It has advantages, however, which more

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than counterbalance this disadvantage. It is to be hoped that warning against this error may suffice to prevent it.

6. Sign your name.

7. Examine the prescription carefully. Remember that an error made is very easily repeated and passed without notice, unless we have rested our mind a little while by occupying it with some other object before looking over our work again. Hence, after having finished writing a prescription, lay it aside for a few minutes, while you are occupying your mind with other matters, such as giving directions for diet and general management. Then **read the prescription over once more,** critically, as if it were a stranger's prescription; and make sure that everything is correct before delivering the prescription to the patient.

2. Choice of Ingredients.

Aim at efficiency and simplicity. To maintain simplicity is a great desideratum. The axiom laid down by Paris in his "Pharmacologia": "In proportion as the physician complicates a medicine, he does but multiply the chances of its failure, unless he be well acquainted with the mutual actions which these bodies exert upon each other and upon the human system" is as true today as when it was first formulated. Hence the first principle in the composition of a prescription should be that a **single medicament should fulfil but a single therapeutic purpose.** If a patient, for instance, requires both a purgative and a hypnotic, let each of these be made the object of a separate prescription. The second fundamental principle is that **a single substance should be prescribed, unless a distinct advantage can be gained by combination.**

However, efficiency must not be sacrificed to simplicity. The rule: "Never give a particle of medicine that is not required" should have as companion: "Give whatever drugs are needed to cure quickly, safely, and pleasantly."

Avoid, therefore, excessive complexity as well as excessive simplicity in prescribing. Excessive complexity may be illustrated by the old-fashioned "shot-gun prescription" in which a dozen or more active and perhaps more or less antagonistic agencies were thrown together into one confused mass on the doctrine that there can't help but be something in it that will

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do good. This prescribing of too many remedies in one prescription is called polypharmacy. While such multiplicity of combination is without doubt the mark of the bungler and ignoramus, extreme simplicity is not an unerring sign of the master in medicine. Undoubtedly there are times when a judicious combination will achieve results not obtainable by any one remedy alone.

The technical names applied to the various ingredients of compound prescriptions are as follows:

(*a*) **The Basis,** the principal ingredient, is written first, if it is the most powerful drug in the prescription. It is a good rule, **always to place first upon the prescription the strongest of the drugs employed.**

(*b*) **An Adjuvant** is sometimes added to the base to assist its action.

(*c*) **A Corrective** may be added for the purpose of rendering the remedy more agreeable to the patient, either by overcoming some undesirable effect, or by disguising the taste or odor of the other ingredients.

(*d*) **The Vehicle** is the carrier, diluent, or solvent in a liquid prescription. It may itself possess some medicinal value. It is to be written last. Excipient is the name applied to the substance added to solid prescriptions, such as pills, to give them their proper consistency.

Of course, the ordering of the basis alone is preferred, if no efficient adjuvant, corrective, or vehicle should suggest themselves, or be needed.

Whenever agents are combined, such combinations should only be made with a clear understanding of the principle involved. The most important reasons for combining are the following:

1. **To meet several co-existing indications.*** For example, in a certain patient heart insufficiency may indicate digitalis, and the presence of anemia render the administration of iron desirable; this may be done by prescribing those drugs in combination. This principle must, however, be applied with caution, for it may lead to polypharmacy. It should be remembered that it is worse than useless to attempt to prescribe for every symptom. The basal condition from which all or most of

*By the term indication is meant an evident need of the system.

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the symptoms spring must be discovered and attacked. When remedies are exhibited together for this purpose, it is frequently well to prescribe them separately and uncombined, because the exigencies of the case may require variation of the dose of the one without corresponding change in the dose of the other.

PROBLEM 15. Order 30 pills, each to contain 0,05 Gm. of powdered digitalis, and 0,10 Gm. of exsiccated ferrous sulphate. One to be taken three times a day.

2. **For joint action.** Frequently a combination of similar remedies will produce a more certain, speedy, and considerable effect than a much larger dose of any one alone, especially if they produce the same ultimate result by totally different modes of operation. Such agents are known as adjuvants. The practice of trying one remedy for a time, then another and another in succession, while best suited for the study of the action of remedies is not always as successful as may be desired in relieving the patient. It may be compared to "putting a single horse to a heavy load, tire him out, then to hitch on another and so on, instead of harnessing a number in a team, and have them all pull together." Where the very best remedy fails when used alone, it may succeed when reinforced by a number of other remedies or modes of treatment, medicinal, physical, or dietetic. The application of this principle, too, requires discrimination. Thus, in lingering diseases patients are likely to become habituated to one remedy and after a while cease to derive benefit from it, when another similarly acting one may be taken with advantage. In such cases we may have to economize our resources by giving one remedy at a time.

PROBLEM 16. Prescribe, for example, for a case of diarrhea 15 powders each composed of 0,01 Gm. of deodorized opium, to lessen peristaltic activity; 0,50 Gm. of phenyl salicylate, as intestinal antiseptic; and 1,00 Gm. of bismuth subnitrate, to act as mild astringent. One powder to be taken every two hours, until relieved.

3. **For crossed action.** There are remedies that have a certain

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can be obtained at the point where the two lines of action cross each other, enabling us to use less of each agent, thus obtaining less of the undesirable effects. Thus, chloral produces sleep and depresses the heart, morphine produces sleep and constipation; by combining chloral and morphine, we get conjoined influence in producing sleep with the least possible disturbance of the other organs.

PROBLEM 17. Hypnotic. Write prescription for 15 teaspoonful doses of solution containing 0,008 Gm. of morphine sulphate, and 0,50 of chloral hydrate in each teaspoonful, with syrup of orange as flavoring. Teaspoonful in water at bedtime; to be repeated once in one hour, if necessary.

4. **To correct the action** by antagonizing unpleasant side-effects of the remedy; as, for instance, the addition of extract of hyoscyamus to purgatives in order to lessen the griping. Such agent is called a corrective.

PROBLEM 18. Compound purgative pills illustrate very nicely the use of medicines for joint action, as well as the addition of corrective. Write for 20 pills, each composed of: 0,01 Gm. of resin of podophyllum, a cathartic acting mainly upon the upper bowel; 0,05 Gm. of extract of aloes, acting mainly upon lower bowel; 0,03 Gm. of resin of jalap, having more action upon the secretions of the bowel than the other two; and 0,015 Gm. of extract of hyoscyamus, which tends to lessen griping, thus acting as corrective to the other agents. One or two pills are to be taken at bed-time.

5. **To direct the action** of the remedy. Thus, to produce local action upon intestines, we may lessen the rapidity of absorption by administering the remedy with colloids; on the other hand, we may increase general action by favoring absorption by the admixture of mild irritants. It seems possible that by increasing the blood supply to a certain organ, which we can do by counterirritation, hydrotherapy, etc., we may be able to direct the action of the remedy more particularly toward that organ. Such agents may be called directives.

PROBLEM 19. [illegible]

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poisonous to man. By combining it with a purgative we lessen its absorption by hurrying it out of the alimentary tract, thus directing its action away from the system. Prescribe four powders, each containing: Santonin, 0,03 Gm.; mild chloride of mercury, 0,03 Gm.; with sugar of milk, 0,06 Gm. as diluent or vehicle. One morning and evening for two doses.

6. **To produce a new substance** by combining bodies acting chemically upon each other, resulting in the formation of new compounds. This may be illustrated by the well-known and highly efficient chlorate of potassium and iron gargle in acute pharyngitis. This gargle contains tincture of ferric chloride, which by reason of its acidity acts upon the potassium chlorate, setting free certain highly unstable chlorine compounds to the presence of which the special efficiency of the preparation seems to be due, as it acts better than when the constituents are used singly or alternately.

PROBLEM 20. Order a solution of 5 Gm. of potassium chlorate, 10 Gm. of tincture of ferric chloride, 30 Cc. of glycerin, with enough water to make 240 Cc. Use as gargle in doses of a tablespoonful every hour.

7. **To obtain an eligible form.** This is part of the subject of pleasant medication. which will be taken up next.

3. *Pleasant Medication.*

Beware of nauseating doses, except when the disagreeableness of the remedy brings with it greater certainty of success, as is sometimes the case in hysteria, in malingering, and possibly also among the ignorant semi-barbarous classes of society in whom disagreeable remedies carry with them expectancy of relief. Under all other circumstances, we should do everything in our power to render our medicines pleasant (a) in appearance, (b) in odor, (c) in taste. Patients will often absolutely refuse to take a disagreeable remedy. Hence really unpleasant medicines should not be prescribed without consulting the patient about it.

An important reason for the widespread use of proprietary remedies is the attention which the manufacturer gives to the elegance of his preparations, and the lack of attention to this point on the part of most physicians. Most of the success of

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homœopathy has been due to the pleasantness of its remedies. Careful attention to render his medicines palatable and elegant will add much to a physician's popularity.

Modern elegant pharmacy has enriched our resources with many means for pleasant prescribing; not only by the perfection reached in producing tasteless solid preparations; but also by the introduction of palatable liquid preparations such as syrups, elixirs, wines, malt preparations; and furthermore by the production of highly concentrated active medicaments, such as fluid extracts and the isolated active principles of plants, which make disguising so much easier.

(a) **Elegant appearance.** Like food, medicine should not only taste well, but also look well. A mixture that looks like mud or like ink, even though its taste be pleasant, may by the very repulsiveness of its appearance nauseate the patient. We should **always endeavor to prescribe clear solutions rather than mixtures**; not only because they look better, but also because the dose of mixtures is much less uniform than that of solutions.

It is sometimes of advantage to impart to our medicines an attractive color; hence coloring of medicines will deserve a share of our study. Coloring may not only be useful by improving the appearance of the medicine; but also by hiding the nature of the medicine from the patient; or by acting through suggestion. Obviously, agents used for this purpose must be harmless.

For yellow coloring use: Tincture of saffron (*tinctura croci** U. S. P., 1890) for watery or alcoholic liquids; annatto* for oily liquids, ointment, or plasters.

For red coloring, use: carmine* (*carminum*) for powders; solution of carmine* (*liquor carmini*, N. F.) for neutral or alkaline aqueous or alcoholic liquids, precipitated by acids; tincture of cudbear* (*tinctura persionis*, N. F.) for acid liquids, in proportion of 0,5:100. For oily liquids, use alkanet.*

For brown coloring, use compound tincture of cudbear* (*tinctura persionis composita*, N. F.) 0,5:100.

For blue coloring, use methylene blue (*methylthioninae hydrochloridum*, U. S. P.), an aniline dye. Most other aniline colors should be avoided as much as possible, since they are frequently more or less poisonous. For powders, ultramarine* or indigo* may be used.

For black, use lampblack.*

*Not official.

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(b) In **the flavoring of medicines,** the volatile oils and preparations containing them are especially prominent. In using these, it must be remembered that very powerful odors are generally less pleasant than more delicate ones. For this reason, flavoring principles should be added in very small quantities only, e. g., 1/5 per cent of volatile oil, or 2 per cent of flavoring spirit or tincture.

To add pleasant flavor to not disagreeably tasting or smelling medicine, the milder flavors are usually preferred, such as lemon, orange peel, orange flowers, anise, fennel, tolu.

More potent, especially for disguising nasty tastes, are pungent substances, such as peppermint, gaultheria, cinnamon, cloves, cardamom, ginger, sassafras, etc.

For disguising of disagreeable odors, the most potent flavoring agents may have to be resorted to; among which may be mentioned: rose, bergamot, bitter almond, lavender, balsam peru, vanillin, coumarin.

EXPERIMENT 1. Try to disguise the odor of iodoform and of ichthyol with some of the above mentioned flavors.

For further information on these drugs consult the reference list.

(c) **Disguising of taste.** A substance to be tasted must be in solution, and must come in contact with the gustatory nerve endings, which must be capable of functionating. We may disguise tastes (1) by lessening solubility; (2) by lessening contact with gustatory nerve endings; (3) by benumbing these nerve endings; (4) by combining tastes.

1. **Lessening solubility.** This is accomplished by giving certain solid preparations, such as pills, tablets, capsules. Furthermore, by administration in form of insoluble or sparingly soluble powder, as e. g., the tannates of alkaloids, which are very much less bitter than more soluble salts.

EXPERIMENT 2. Compare taste of quinine tannate with that of quinine sulphate.

2. **Lessening contact with gustatory nerve endings** by means of non-absorbable, slimy, colloid substances, (demulcents), such as gum or starch mucilage, which act by enveloping the substance and forming a protective layer over the mucous membrane, and in this way prevent, to some extent, access of the

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substance to the taste organs. Thus, though themselves entirely tasteless, they are capable of markedly diminishing the tastes of all, but most especially of sour, sharp, and acrid substances. Milk acts in this manner, and has the power of lessening the taste of many substances; for this reason it forms a very useful domestic vehicle for the administration of such medicaments as iodides, bromides, salicylates, capsicum, etc.

EXPERIMENT 3. Compare taste of 1 per cent solution of potassium iodide in water and in milk.

3. **Benumbing gustatory nerve endings.** This may be done by heat or cold. Very hot or very cold substances cannot be tasted, the best temperature for tasting being between 10°-35° C. Among the drugs which paralyze the nerve endings of taste probably the least objectionable is yerba santa (*eriodictyon*). It destroys bitter taste, but not sweet, salt, or acid.

EXPERIMENT 4. Note difference in taste of a 1/10 per cent solution of quinine sulphate and one to which yerba santa has been added (10 per cent of fluid extract, *fluidextractum eriodictyi*). The aromatic syrup of eriodictyon (*syrupus eriodictyi aromaticus*, N. F.) is an excellent vehicle for quinine.

4. **Combining tastes.** Decided tastes, when mixed, greatly obscure each other. Sweetening renders alkaline, sour, or salty preparations more acceptable; but it does not improve much the bitter or the "astringent" taste. Syrups are generally used for the purpose of sweetening; they should not be employed undiluted, however, as their thickness renders them rather disagreeable to take unless a cough remedy is prescribed, when the viscidity of the medicine may be desirable so as to cause it to cling to the throat and effect local medication. In case sugar or syrups cannot well be used for sweetening, as, e. g., in tooth powders, emulsions, and for diabetics, saccharin (*benzosulphinidum*, U. S. P.) which is 300 times sweeter than sugar may be resorted to. Another sweetening agent, especially agreeable to children, less so to adults, is glycyrrhiza, which may be used in form of the official fluidextract (*fluidextractum glycyrrhizae*), or the syrup of the N. F. (*syrupus glycyrrhizae*). Adjuvant elixir (*elixir adjuvans*) owes part of its sweetness to glycyrrhiza. Remember that the sweetness of glycyrrhiza is destroyed by acid.

The sour taste is likewise useful for disguising, especially

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salty or insipid tastes. Citric acid (*acidum citricum*) may be used, in proportion of about ½ per cent, or the syrup of citric acid (*syrupus acidi citrici*).

Pungent substances, such as the spices, alcoholic preparations, carbonated water, are also useful to obscure disagreeable taste sensations. Bitters are most improved by aromatics. Note, for example, the pleasantness of compound tincture of gentian (*tinctura gentianae composita*). The "astringent" taste is better disguised by alcoholic liquids than by syrups.

EXPERIMENT 5. Try the taste disguising qualities of adjuvant elixir upon quinine sulphate, potassium iodide, etc.

4. Incompatibility.

Incompatibility (pron. in-kom-pat-ib-il'-it-e) is said to exist when **the constituents of a mixture interfere with one another in a way not intended by the prescriber**; the word "incompatible" (from Latin *in*, not, and *compatibilis*, endurable) meaning incapable of existing together in agreement or harmony. Three varieties of incompatibility are spoken of:

1. **Chemical incompatibility** occurs when a new chemical compound results. It may generally be known in one of three ways: (a) By formation of insoluble compound (precipitation); (b) by evolution of gas (effervescence or explosion); (c) by change in color. If any of these changes are desired by the prescriber, true incompatibility cannot be said to exist. The avoidance of this form of incompatibility rests upon a knowledge of the ordinary chemical reactions, and when these are mastered, the subject is comparatively easy and simple. It may be laid down as a general rule that substances are incompatible if they are used in testing for each other, or if they form antidotes.

2. **Pharmaceutic incompatibility** results in the production of an unsightly appearance due to *physical* changes, mainly on account of precipitation of a substance by a change in the solvent. The avoidance of this requires an intimate knowledge of the solubility of all the common remedies in the ordinary solvents.

The reference list in this book is intended to assist in the

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each other's action in a *way not intended by the prescriber.* The avoidance of this form of incompatibility depends upon a knowledge of pharmacology and therapeutics.

5. The Directions to the Pharmacist.

This part of prescriptions, which is also known as the *subscription,* is generally very simple. In olden times, before the day of pharmacopœias, the subscription was very complicated, as it had to direct the pharmacist on many points, on which the latter now receives his instructions from the pharmapopœia.

Frequently the subscription includes only two letters, which are generally written on one line: "M. S." The letter M., which is the abbreviation for *misce,* meaning mix, implies all the manipulations necessary to compound the prescription. Misce is, of course, to be omitted in case the prescription contains only one ingredient. The letter S. is the abbreviation for *signa,* meaning mark, directs the druggist to label as follows.

Other subscriptions will be discussed in part II of this book in connection with the preparations in the prescribing of which they are used.

6. The Directions to the Patient.

For this part of the prescription the author would propose the name *transcription* instead of the ancient one *signature,* as the latter is currently used in a different sense. As these directions are for the patient's guidance, they should if possible be written in the language the patient understands, or otherwise in English. Writing the transcription in Latin makes it necessary for the druggist to translate it into the language the patient understands, which introduces the chance of an error in translation.

These directions should include everything which it is necessary for the patient to know regarding the use of the medicine. The size of the dose, and the time and frequency of administration should be distinctly stated. If the medicine is to be diluted with water, milk, or carbonated water, this should be distinctly stated in the transcription; best in the following form, e. g., "take teaspoonful in water at bed-time." Do not write: "Take teaspoonful at bed-time in water," as it might

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not be clear whether the patient or the medicine should be in water. When medicines are to be taken at meal time, it should be stated whether the dose is to be administered before, during, or after the meal, as it often makes considerable difference in the effect.

There are exceptional cases, however, when it may be preferred to rely on the patient's memory rather than to label his medicine so distinctly as to arouse in the minds of others suspicions as to the character of his malady. For example, it is well to write "Wash" rather than "Urethral Injection." Medicines intended for external application should be plainly labeled to that effect; as such medicine taken internally may produce poisoning.

A very poisonous medicine should be labeled "Poison"; provided, of course, that there is no special objection to the patient's knowing that he is using a poison; as there might be in case of a nervous patient, who would be likely to be unduly alarmed by the knowledge that his medicine contains poison.

7. *Methods of Administration.*

It is often quite as important to know how to give a remedy as to determine what to give. Thus it must always be clear in the mind of the prescriber whether local action, i. e., action at point of application, or general action (which occurs after absorption), is desired. For, as a general proposition, local action is in inverse proportion to the degree of general action; and we have means of regulating to a certain extent not only by the time but also by the method of administration, the amount of absorption, hence the degree of local and of general action. It is necessary to be familiar with all the modes of introducing remedies into the body; for, of course, the most direct channel to reach the seat of disease by medicament will generally be preferred; and, furthermore, in the diversified

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(*A*) *Administration for local Action.*

(Topical Application.)

The subject naturally divides itself into three parts: (1) Action upon the skin, (2) upon mucous membranes, (3) upon the underlying tissues.

(1) In planning **applications for local action upon the skin,** we must remember that one of the most important functions of the skin is to protect the body against the action of irritants; it being covered with a layer of dead keratinized cells, and coated with a fatty substance, the sebum. This protection is most efficient against watery solutions of non-volatile substances, which are not at all absorbed by the unbroken skin. Watery liquids can therefore only be used with success, when merely surface action is desired. Thus, when it is intended to kill microbes or other parasites upon the skin, watery solutions are especially useful as they produce maximum effect upon the parasite, with a minimum of action on the structures beneath. An aqueous solution intended for local application without rubbing is known as lotion (*lotio*, gen. *lotionis*) when used on a limited part; bath (*balneum*, gen. *balnei*) when used on the general surface. Of course, only the active ingredients of a medicated bath are ordered of the apothecary. In determining the quantity of medicament needed for a bath, we may figure on 50 to 100 L. for a child's, and 200 L. for an adult's bath.

When, however, vessels or nerve endings of the skin are to be affected, penetration through the fatty and the horny layer of the skin are required; which can be obtained by the use of agents that mix with fat, or by the application of volatile substances; hence the importance of ointments, oleates, and liniments. Penetration of these agents may be favored by thorough preliminary cleansing with soap and water, by friction, by heat, and by occlusive dressings. As under these circumstances, a certain amount of absorption into the system takes place, we must guard against poisoning from potent applications by not making them too strong or too extensive.

The interesting fact may here be mentioned that by means of the electric current even non-volatile substances in aqueous solution may be forced through the protecting layers of the

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skin: This process is known as cataphoresis. The quantity that can thus be introduced is, however, very small. Still, it is large enough to enable potent agents to exert a local action upon the tissues of the skin, especially if the rapid carrying away by the blood current of the substance that has been deposited in the skin is prevented by lessening the blood stream by means of constriction. This method has, for instance, been used, with some success, in the production of local anesthesia by means of cocaine.

Once the dead horny layer of the skin has been removed, or its continunity interrupted, the absorptive function of the tissue, and its relation to medicaments approximate those of the mucous membranes. Hence abraided, excoriated, and ulcerated surfaces of the skin must be treated like mucous membranes, and not like skin. **Applications that would be harmless when used on the unbroken skin, may become poisonous when made upon a raw surface.**

(2) **Applications to mucous membranes** have to deal with water-soaked surfaces of great absorbing capacity for aqueous solutions, but incapable of absorbing oily liquids, unless they are volatile. Most important differences exist among the various mucous membranes in regard to accessibility and sensibility, which necessitate considerable difference in method of medication.

(*a*) **The conjunctiva** is one of the most accessible as well as most sensitive of mucous membranes. Very mild aqueous solutions are most commonly used; either a few drops instilled into the eye by means of a glass pipette with small rubber bulb, such solutions being popularly known as "eye drops," technically as collyria; or else the conjuctival sack is flushed with large quantities of fluid (irrigation). In the use of collyria, the patient throws his head backward, the lower lid is gently drawn down and the solution dropped into the lower cul-de-sac of the conjunctiva. Not more than one or two drops will be retained in the conjuctival sac. In the use of injections and irrigations, not only in the eye but also elsewhere, the temperature of the fluid is of importance; it should be at or slightly above the temperature of the body, unless special effects by heat or cold are aimed at. As a precaution against the constitutional effects of drugs such as the mydriatics not more than two or three drops

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should be used at a time; and the end of the finger may be pressed over the lachrymal canals for a few minutes to prevent passage of the fluid into the nose and throat. Powders may be dusted on the conjunctiva from a camel's-hair brush, the handle of which is held between thumb and forefinger, while the brush is struck sharply with the little finger of the same hand.

Minute gelatin discs medicated with definite quantities of potent drugs, such as atropine, eserine, etc., are occasionally used in the eye instead of aqueous solutions. The chief advantage claimed for them is that by their slow solution the drug is maintained more continuously in contact with the conjunctiva than it would be were it applied in aqueous solution. The disc is applied by placing it against the conjunctiva by means of a moistened camel's-hair brush.

(*b*) **The nasal mucous membrane** is rather difficult of thorough access and very sensitive. It may be medicated by snuffing up dry powders or fluids; this is, however, an imperfect method. Powders are better blown into the nose by means of powder insufflators; fluids, poured into the nose from the palm of the hand, teaspoon, or little apparatus devised for this purpose, while the head is thrown back. Small quantities of fluid are best applied by means of absorbent cotton upon a roughened probe. Large quantities of fluid may be injected by means of India rubber syringes, or the douche bag; the fluid then escaping from the other nostril (irrigation*), owing to the fact that when fluid is injected into either nostril, the palate at once rises so as to shut off the naso-pharynx from the pharynx, and thus the stream is directed out of the opposite nostril. The great danger of such injections is that the fluid may enter the Eustachian tube, and through it the middle ear, which is very liable to become inflamed in consequence. Hence great care should be used to avoid excessive pressure; and the patient must be cautioned not to attempt swallowing or speaking, lest these acts should open the Eustachian tubes. Another way of medicating and cleansing the nasal passages is by means of the spray; by this term we understand a liquid blown into minute particles by means of a strong current of air or steam. Sprays

* An injection is a lotion introduced into cavities of the body by means of a syringe. An irrigation differs from an injection in that a continuous outflow is established.

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are safer and probably quite as effectual as irrigations. **Inhalations** are also used in the treatment of nasal disease, though less frequently than in disease of the larynx, trachea and bronchi (see below). Here the point may be emphasized that sprays are thrown in, inhalations are drawn in the nose, mouth or throat by the act of breathing.

(*c*) **The mouth** is directly accessible **and the pharynx** practically so; both membranes are among the least sensitive mucosæ of the body. Lozenges (*trochisci*) are medicated candies; forming, wherever applicable, a most delightful and thorough application to the mouth and throat. Palatable lozenges cannot, however, be made of very disagreeably tasting medicines. Furthermore, it must be remembered, that the stomach and intestine are likewise subjected to the action of the remedy; that, indeed, the system may become affected by absorption; these effects may be desirable, or may render this form of administration inadmissible.

Gargles are lotions intended for self-use in the pharynx. Whether gargling will be efficient or not, depends upon the manner in which it is performed. The patient should take a mouthful of fluid, throw back his head, and then—instead of making the customary "gurgle"—should allow the liquid to pass as far down as possible without swallowing it; this may be done by performing the first and second act of deglutition; but, as the fluid is about to pass into the esophagus, regurgitating it, which may be facilitated by a forward inclination of the head. When the act of swallowing is impaired, either from pain or paresis, gargling is unreliable. In the very young it cannot, of course, be used.

Whenever gargling cannot be done effectually, recourse may be had to the spray, which, though it does not reach the recesses at the side of the pharynx, is less dependent for its results upon the volition of the patient. We should distinguish between two kinds of sprays, the coarse and the fine. The coarse spray is to be preferred in the treatment of nasal and pharnygeal conditions, since such spray is superior for the dislodgment of secretions. The fine spray, on the other hand, is necessary in the treatment of the larnyx and the lungs, because the coarse spray is too heavy to be carried deeply by means of

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the respiratory air currents. Inhalations are also employed in the treatment of pharnygeal disease.

Pigments, i. e., liquids that are painted on, form one of the most serviceable methods of medicating the pharnyx. The application is made by means of a camel's-hair brush, which should be moist, but not dripping; for a drop might fall into the larynx, causing distress. Most patients can make such applications upon themselves; and mothers or nurses may be taught to carry out this maneuver for children.

(*d*) Direct applications can be made to **the mucous membrane of the larynx** by means of suitable brushes, syringes, or powder insufflators; but the special and delicate manipulation that is required can not be discussed in a work of this kind. By far the most popular method of medicating the larynx is by means of inhalations, as they can be administered by the patient himself. As, furthermore, the air passages beyond the larynx are accessible only through inhalation, the importance of a thorough understanding of this method of administration will be appreciated.

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Inhalation may seem the simplest and most direct method of affecting the respiratory passages. This is true as far as the upper respiratory tract is concerned; it is most difficult, however, to introduce any but the most volatile substances beyond the trachea and the main bronchi. There are three distinct methods of obtaining an inhalation, to the advantages, disadvantages, and technique of each of which, it is desirable to call attention at this place.

(1) Steam inhalation. This consists in the inhalation of steam charged with the vapor of a volatile substance. For its production, a wide-mouthed receptacle is necessary; an ordinary pitcher, giving a surface of water of not less than 4 or 5 inches diameter may be used. Into this is placed hot (120° F.) water so as to leave an air-space of at least 4 inches above the level of the water; the medicament is added, and the whole is stirred for a few moments. It is then covered with a cone of paper or other suitable substance, the steam being allowed to escape through the truncate apex, over which the mouth is placed, or a towel may be applied over the mouth of the pitcher to direct the vapor into the patient's mouth. In order to inhale effectually, the patient, after having drawn the vapor into the mouth

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should follow the suction effort by a deep inspiration. These inhalations act mainly by their warmth and moisture, which is relaxing and soothing. Their use is, however, limited; because, in the nose, the imbibition of moisture tends to cause swelling of the turbinate bodies, thus increasing obstruction to respiration; and, because, on the whole of the respiratory mucous membrane, warmth and moisture always make patients especially liable to take cold. Hence all exposure under these circumstances is extremely dangerous; and, unless the patient is confined to a room at even temperature or will stay in the room for at least one hour after the inhalation, such treatment should not be prescribed, excepting to be taken in the evening before going to bed. Steam inhalations are especially useful in acute laryngitis, and in the first stage of acute bronchitis. They are rarely indicated in chronic affections. Steam inhalations by means of steam atomizers are somewhat more efficient than the method above outlined; they are subject to the same indications and contraindictions.

(2) Vapor inhalation at ordinary temperature. One of the simplest and most useful devices for this purpose is the "perforated zinc respirator" described by Dr. Burney Yeo. It consists of a little cage of perforated zinc, which fits over nose and mouth and carries a sponge upon which the volatile medicament is dropped and through which the respired air is drawn, thus becoming impregnated with the vapor. This little apparatus can be worn for any length of time; permitting even a continuous medication of the respiratory tract. This may be desirable if the medicinal agent is unirritating and not toxic. Ordinarily, 10 to 20 drops of the volatile oil are added to the sponge, previously moistened with alcohol; and the inhalation is continued at first about ten minutes every two, three, or four hours. If in acute inflammatory conditions of the respiratory tract, too large a quantity of oil be dropped upon the inhaler, or if the time of inhalation be extended beyond 15 minutes, the patient is apt to suffer from irritation. In the later stages of the disease, and after the patient has acquired tolerance, the inhalation may be continued for one-half or one hour at a time. Often, if the use of such inhalation has to be continued for weeks, it is found that an inhalant which at first proved useful, later seems to loose its effect; under these circumstances, it is well

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to remember the general therapeutic fact that tolerance is established toward therapeutic as well as noxious irritation; and that, to obtain continued benefit, we have to substitute a new agent.

(3) Nebulization, (also called *atomization*, or *pulverization*), is the mechanic division of liquids into exceedingly fine particles constituting a veritable cloud or mist (*nebula*), which is to be inhaled. The apparatus for the production of these sprays, may be obtained with rubber hand-bulbs, useful for home treatment; while, for physician's office use, the sprays are best driven by air drawn from a reservoir in which it may be compressed by a force pump. Aqueous as well as oily liquids may be used; the latter being in general the best tolerated; liquid petrolatum being probably the most useful vehicle. If a small quantity of volatile oil is added to liquid petrolatum, e. g., 1 per cent, the spray is soothing; and applicable to acute catarrhal inflammations. If larger quantities are used, e. g., 25 per cent, the application becomes stimulating and useful in chronic conditions.

Practice in Prescription-Writing—Inhalations.

PROBLEM 21. Inhalation in acute congestion of pharynx and larynx. Compound tincture of benzoin, teaspoonful of which is to be added to pint of water at 120° F. in suitable inhaling apparatus. Inhale for five minutes every four hours.

PROBLEM 22. Vapor inhalation in bronchitis. Equal parts of creosote, alcohol, and spirit of chloroform. Place 15 drops on inhaler, inhale for 15 minutes every three hours.

PROBLEM 23. Inhalation in coryza. Menthol, 2,0 Gm.; camphor, 1,0 Gm.; liquid petrolatum, 30,0 Cc. Place in nebulizer and inhale several times a day.

(*e*) **The stomach and intestines** are reached through the mouth. By properly timing the administration, the medicine can be made to exert its action upon the gastric wall; or be introduced quite directly into the intestine, see p. 29. The stomach may be protected from the action of a remedy, that is intended to act upon the intestine, by means of pills with "intestinal" coating, i. e., pills with coating insoluble in the stomach, but soluble in the intestine (see article on pills). In medicating the stomach and intestine, it must always be remembered

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that we have here a great absorbent surface; it is only by insolubility or by non-absorbability of the medicament that local action can be obtained uncomplicated by general action; thus bismuth subnitrate gives pure local action because of insolubility; magnesium sulphate, because of non-absorbability. Another way in which the action of medicament may be confined to the stomach is to use it in gastric lavage, i. e., by introducing the remedy by means of the stomach tube, and withdrawing it before there has been sufficient time for absorption.

(*f*) **The rectum** may be medicated by suppositories (q. v.) or by injections. Rectal injections, also known as enemata. (*enema-atis*), clysters, or lavements, may be large or small; they may be given high or low. An enema of less than half a liter might be considered a small enema; of more than half a liter, a large enema. A low enema is one injected by means of syringe with small hard-rubber tip; a high enema is given with a soft-rubber tube introduced as high up in the rectum as possible. The lower part of the rectum, where the hard-rubber tip deposits the injection, is normally exceedingly intolerant of distention, which is responsible for the prompt evacuation of any fecal matter that arrives in this part of the bowel. For the same reason, even a small enema, when given low, may cause evacuation. The upper part of the rectum, which is reached by the high enema is more retentive, as well as more absorptive.

It is always well to precede an enema that is to be retained by a cleansing enema, so as to unload the part of fecal matter that may be contained in it, and thereby lessen distention and favor retention. It is furthermore desirable to make the enema as small in bulk as possible. A low injection that is to be retained should not be larger than 100 Cc. A larger quantity may, however, be retained when injected high; less than 300 Cc. can usually be retained voluntarily as long as desirable. Enemata that are to be retained should be quite devoid of irritating properties. The retention of an irritating substance may

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perature favors retention, as the extremes of temperature excite peristalsis. On withdrawing the nozzle of the syringe, a napkin should be pressed against the anus; the patient should occupy the recumbent position for at least an hour after the injection; and should be instructed to resist any inclination to strain.

If evacuation is aimed at, modification of the injection in various respects, according to the principles just laid down, will easily secure the result.

In prescribing enemas, the medicating ingredients are ordered from the apothecaries' in form of a solution, which is then diluted, if necessary, with water, salt solution, or starch water just before administration.

Ointments may be applied to the rectum and anal margin by anointing the finger, and gently introducing it through the sphincter. Or else, the ointment may be dispensed in a collapsible tube, such as is used for holding artists' colors. To the end of this tube is fitted a small piece of soft-rubber tubing, which is inserted into the rectum. By pressure upon the collapsible tube the ointment may be forced into the canal without difficulty.

Practice in Prescription-Writing.—Enemata.

PROBLEM 24. Convulsions in child. Prescribe 2 doses of chloral hydrate, 0,3 Gm.; sodium bromide, 0,6 Gm. in tablespoonful water. Dose to be diluted with 2 tablespoonful of starch water and given by high rectal injection.

PROBLEM 25. Small evacuant enema. Magnesium sulphate. 60,0 Gm.; glycerin, 30,0 Cc.; water, 120 Cc. To be used as injection.

PROBLEM 26. Enema for relief of tympanites. Oil of turpentine, 8,0 Cc.; emulsion of asafetida, enough to make 180,0 Cc. To be used as injection.

(*g*) **The mucous membranes of the urethra and of the bladder** are highly sensitive. Only very mild solutions are tolerated in form of injections.

When the male urethra is to be medicated by injections it is always well to have the patient urinate before using the injection, as the urine cleanses the mucous membrane of secretions, and permits the remedy to come into more direct contact with

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the diseased part. The patient should be in the sitting position, well forward on the edge of a chair. If it is very important to obviate the possibility of the fluid entering the bladder, the patient should sit on a folded towel, which will cut off the deep uretha; usually, however, the cut-off muscle of the urethra suffices to secure this result. The penis should be held between thumb and fingers of the left hand. The meatus is opened by gentle pressure, the syringe is introduced, and its contents are gently discharged into the urethra. The syringe is then removed; and the meatus immediately closed with the fingers, so as to prevent the escape of the fluid. In this manner the injection may be retained as long as desired. While the fluid is being retained, it is well to make gentle stroking pressure over the under surface of the penis with the right hand, as this insures contact of the solution with all portions of the canal.

The urethra may also be medicated by the insertion of medicated bougies (q. v.). Ointments may be applied to the urethra by means of a sound smeared with the medicament; or else by having the ointment dispensed in a collapsible tube, and introducing it into the canal by means of a small soft-rubber tube, as described in connection with rectal medication by ointment.

For making injections into the bladder a soft rubber catheter is introduced into it, with all the precautions of asepsis. After the urine has escaped the nozzle of the syringe is fitted to the catheter; and the desired amount (50-100 Cc.) of fluid gently and slowly thrown into the bladder. Care must be used not to inject any air, as its presence tends to cause decomposition of urine within the bladder. The fluid is permitted to remain for a short time, it is then allowed to escape; and the process repeated two or three times, or until the return fluid indicates that the object aimed at has been attained.

Both bladder and urethra may be medicated in a very mild degree by swallowing drugs that are freely eliminated in the urine. Of course, under these circumstances, the effect which the remedy may have upon the alimentary tract and upon the system will have to be reckoned with.

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instrument for the purpose is a "fountain" syringe with a hard-rubber nozzle, which should be five inches in length, the extremity of which should have small openings at the side, but no opening at the end. The patient can easily syringe herself in the sitting posture. The bag filled with the injection is hung up three or four feet above the level of the seat. The patient sitting over an ample receiving vessel inserts the nozzle and turns on the stopcock. While the irrigation proceeds, the nozzle should be rotated from side to side, withdrawn and pushed up from time to time, so as to secure as thorough an irrigation of all the parts as is possible. More thorough, however, likewise more inconvenient, is the douche, when the patient is in the knee-chest, or in the dorsal position with the hips elevated. In these positions the vagina must become completely filled with fluid, before any of it escapes; the weight of the fluid distending the canal, and bringing the injection in contact with every point of the surface. The patient can hardly administer the douche in this position herself. It is well for the patient to remain in the recumbent position for some time afterward; and for this reason, it is well to administer the last douche at bed-time.

Vaginal suppositories, also known as medicated pessaries, (q. v.), are another method of medicating this membrane. By means of exposure with the speculum, applications may be made to the cervix uteri, the uterine canal, or to any part of the vaginal mucosa. There are also specula for the urethra as well as for the rectum, by means of which direct applications can be made to diseased parts of these membrane.

Injections can be made into the uterus; but they are dangerous because of the possibility of leakage of fluid through the Fallopian tube into the peritoneal cavity, which may produce peritonitis.

(3) **Application of medicament to parts beneath the surface.** Injection by means of a syringe provided with a sharp hollow needle enables us to medicate locally a number of deep organs for a few special purposes. Medicament may be deposited in the parenchyma of muscles, glands, lungs, tumors, (intraparenchymatous injection) and in or near large nerve trunks, by the following modification of the technic of the hypodermic injection, (q. v.). The needle attached to the syringe and filled with fluid by holding its point upward, and pressing upon the

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piston until the first drop appears at the end, is inserted directly into the organ it is desired to reach. The barrel of the syringe is then screwed off to see whether blood flows from the needle. If this occurs, it means that the point of the needle is engaged in a larger vessel; and must, therefore, be withdrawn. If no blood flows, screw on the barrel and inject.

Another method of medicating special deep structures is the intraseral injection, i. e., injection into serous cavities. It is used, for instance, in the obliteration of hydrocele by the injection of irritants, as well as in the intraspinal method of cocainization, in which cocaine is injected directly into the spinal subarachnoid space to act on the nerve roots. The needle, without being attached to the syringe, is inserted into the serous cavity; that the point of the needle is in the proper place, is indicated by the appearance of the serous fluid at the open end of the needle. Now the syringe is attached to the needle, taking care not to introduce any air; and the injection accomplished.

For intraspinal injection, also known as subarachnoid injection, a strong needle about 3 inches long is necessary. This needle is inserted in the interspace between the third and fourth lumbar vertebræ, which is best found by Jacoby's rule: the line connecting the highest points of the iliac crests cuts the spinous process of the fourth lumbar vertebra. The needle is introduced between this and the next higher process, about 1/3 inch to either side of the median line. As the point of the needle passes into the cavity, the resistance can be felt to diminish suddenly. The appearance of the clear spinal fluid at the outer end of the needle is the sign indicating that the point of the needle is in the subarachnoid space, the filled syringe is now attached to the needle, and about 1 Gm. of fluid may be injected. The observance of strictest surgical asepsis is imperative in the performance of this procedure, which without asepsis is exceedingly dangerous.

(*B.*) *Administration for General Action.*

1. Oral Administration.

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to convey this meaning; while oral administration, proper, might mean the use of the oral cavity itself for the introduction of medicines into the system, the remedy being readily absorbed into the general circulation by way of the vessels of mouth and pharynx without being swallowed. This method is especially valuable for administration of small quantities of powerful agents, when the patient cannot swallow. Hypodermic tablets may be placed under the tongue, or drops of liquid on the back of the tongue.

Alimentary administration is the most ancient and most convenient method of administering drugs. We always administer medicines in this way unless there is a distinct advantage to be gained by other methods. Even when the patient cannot swallow, the remedy may often be most advantageously introduced into the stomach by means of the stomach tube. When, however, the remedy deranges digestive functions, or when there is disorder of the alimentary tract, as vomiting or purging, or disease, as inflammation or ulceration, the burden of absorption may have to be placed elsewhere.

It should be clearly understood that as long as a substance simply remains in the alimentary tract it can only have a local action upon its walls; but affect the cells of the body at large no more than if held in the hollow of the hand. Thus the importance of the study of the conditions influencing absorption becomes apparent. Absorption depends upon the following factors:

1. Physical and chemical peculiarities of the substance to be absorbed. As long as a substance remains undissolved, it cannot be absorbed; hence solubility is an important factor in absorption. It must be noted in this connection that drugs which are insoluble in the test-tube may become soluble by the action of the digestive juices, while some that are soluble may be thrown down in insoluble form. Crystalloids are more rapidly absorbed than colloids. Volatile substances penetrate tissues more rapidly than non-volatile substances. Alkaloids are more readily absorbed than glucosides.

2. Concentration. Substances are more rapidly absorbed when they are swallowed in solution than when taken dry, evidently because of time consumed in solution. The more concentrated the solution, the greater is its irritant action upon

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the stomach, and the more rapid its absorption. Pure substances are more quickly absorbed than when much inert or insoluble matter is associated with them; thus morphine is absorbed more quickly when given pure than when given in form of opium, in which it is mixed with gums and other bodies, from which the morphine must be extracted before it can be absorbed. We, therefore, prefer the pure, active principle when general action is desired; the less pure forms, such as extracts, when local action is to be elicited. It will now readily be seen why a full stomach delays general, and prevents local action; why, for instance, a glass of whisky on empty stomach may make a man drunk, while twice the quantity taken on full stomach may not.

3. Vascular conditions of the absorbing surface are of importance. Absorption is in direct ratio to the vascularity of the part. Hence irritants, by increasing the blood supply, favor absorption. Furthermore, absorption is in inverse ratio to the relative quantity of circulating fluid; hence bleeding or purging favors absorption by depleting the system of fluid, which is then greedily absorbed from any place where it may be available. Absorption from dropsical areas is very poor.

4. Nervous conditions. Shock and collapse, pain and delirium, delay absorption in some manner as yet not well understood. Do not push drugs under these conditions beyond the line of safety, for the patient may develop symptoms of poisoning when he rallies from his original condition.

2. Rectal Administration.

The office of the rectum is to throw out rather than to absorb; its juices are alkaline and of feeble solvent power. Still, the rectum is capable of a considerable degree of absorptive activity. This is resorted to mainly when the stomach is non-retentive on account of vomiting; likewise when it is desired to spare the stomach and intestine from the action of the drug, or to protect the drug from the action of the digestive ferments. Because of the slowness of absorption, the dose per rectum is generally double that by the stomach, except in case of strychnine. Suppositories or enemata may be used. In order to favor its retention the enema should have the temperature of the body, should

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be as small in bulk as possible (not more than 30-60 Cc.), but not so concentrated as to produce local irritant effect.

3. Inhalation.

The lungs are a large sponge with air passages on one side, and blood vessels on the other side of a thin membrane, presenting an enormous absorbing surface of great vascularity. Only volatile substances are absorbed from this surface; and for these, inhalation furnishes a rapid, almost direct, admission into the blood. Most substances absorbed by the lungs are also excreted by them, so that the rate of absorption depends upon the relative concentration of the substance in the air of the air vesicles and in the blood. Accordingly, when the air contains more of the vapor than the blood, the substance passes into the blood; as soon as the conditions are reversed and the blood contains more of the drug than the air of the alveoli, it commences to pass backwards. Hence the dose by inhalation depends upon the concentration of the vapor and the length of time of its administration. On account of the promptness with which the agent can be made to pass either into or out of the blood, we have a very nice control of the quantity present in the blood by varying the concentration of the vapor. This is the reason why certain substances—*e. g.*, the general anæsthetics, such as ether or chloroform—are always administered by inhalation. Non-volatile substances, even when finely subdivided (*sprays*), are practically not absorbed from the air passages and exert mainly local action.

4. Epidermic Administration.

(*a*) Inunction is the rubbing-in of medicinal substances, especially ointments and liniments. Inunction is not a quick nor a direct way of getting into the circulation; but it is an even way, and furnishes a permanency and constancy of medication which no other route supplies. The main objection is the uncertainty of dosage. Absorption being much less, the quantity applied is much larger than that which would be used internally; indeed, many medicines intended for external use would be violent poisons if they were swallowed. Inunction, as a method of introducing medicine into the system, is useful when action upon the alimentary canal is to be avoided (mercury) or when

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it is necessary to push the medicine (*e. g.*, cod liver oil) into the system by every possible avenue of entrance. Apply where the skin is thin, as free from hair as possible, and well supplied with lymphatics, as on the flexor surfaces. Change point of application frequently. It is often well to use the various available surfaces in regular sequence, thus, e. g.: First day, inner surface of left arm; second day, left flank and groin; third day, inner surface of left thigh; using on the fourth, fifth and sixth days the corresponding surfaces on the opposite side of the body, and then starting over again. This avoids undue irritation of any one point. The more thoroughly rubbed in, the more rapid the penetration. Heat and irritants favor likewise. Preliminary cleansing with soap and hot water helps absorption.

(*b*) Fumigation is another epidermic method. The patient is placed naked upon a cane-seated chair. He is covered with a blanket which is tightly fastened around the neck. The vapor, e. g., of calomel, is generated by a vaporizing apparatus placed beneath the chair. It is well to precede the medicinal vapor by steam until the patient is perspiring.

5. Endermic Administration.

As previously noted, it is the horny layer of the epidermis that is mainly responsible for the slowness of absorption by the skin. The skin absorbs readily enough if we overcome this resistance by removing the horny layer or by injecting beneath it. This is the endermic method of administration. The horny layer may be removed by scratching with a sharp point, which is the method usually employed in vaccination. It may be removed by blistering and then snipping off the loosened membrane; by which means a raw surface is produced, from which substances are readily absorbed. This method was resorted to before the days of hypodermic administration; it is practically never used at present. If the needle of a hypodermic syringe is inserted into and not underneath the skin, it will be found to be in very resistant tissue, within which may be deposited a drop or two of solution, this immediately resulting in the production of a circumscribed flat elevation, called a wheal. This method is used in the so-called "infiltration anæsthesia," which produces anæsthesia by use of a minimum quantity of cocaine.

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6. Hypodermic Administration.

This method of administration, also known as subcutaneous administration, though but recently introduced (by A. W. Wood, 1855), has become by far the most popular next to administration of drugs by the mouth. It is an injection into the loose tissue beneath the skin by means of a hollow needle attached to a small syringe whereby the medicament is introduced directly into the lymph stream, by which it is carried into the general circulation, usually within a few minutes. On account of the rapidity and completeness of absorption, the hypodermic dose is about one-half of the oral dose. The promptness of its effect and the exactness of dosage that can be secured by it have made this method very popular.

It is resorted to when the medicine cannot be swallowed (unconsciousness), or retained (vomiting, purging), or when special rapidity of action is needed (pain, hemorrhage, poisoning), or when the substance is rendered useless by the digestive juices (antitoxin). It should be remembered that even when hypodermically administered, absorption may be slow in conditions of lymph stagnation; hence remedies should never be injected into a dropsical area. For similar reasons, hypodermic administration may be disappointing in such conditions as heart failure, shock or collapse.

The method is not without its restrictions, disadvantages and dangers.

Not every medicament can be given hypodermically. The agent must not be severely irritant, else it will produce great pain, even subsequent inflammation and abscess formation.

An insoluble substance deposited beneath the skin is liable to produce irritation; hence solutions for subcutaneous injection should be perfectly clear; and only such substances may be used that are soluble in water or in some reasonably bland fluid, such as diluted alcohol, diluted glycerin, oil or solutions of mild salts. Undiluted alcohol is too irritant. As the bulk of the solution must not be great, the average capacity of hypodermic syringes being 2 Cc., nor the solution be concentrated, only very active medicines, given in small doses, are suitable for this purpose. The solution should be as nearly as possible neutral, as acid solutions are painful. It must be sterile, as living germs

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injected beneath the skin may give rise to serious infection. To sterilize water, boil it for 15-30 minutes. Heat sterilization destroys delicate organic principles, such as alkaloids; hence these are best dissolved in an antiseptic solvent, such as chloroform water. On account of the proneness of most of these solutions to spoil on keeping, it is generally best to prepare them immediately before use, for which purpose the hypodermic tablets (q. v.) are a great convenience.

Pain is the chief disadvantage of the hypodermic method. But the pain which is produced by the needle is trifling if the needle is bright and sharp, and if it is driven in and withdrawn by a swift and steady hand. Never inject in a part where the tissue is dense and unyielding, otherwise the distension produced by the deposited fluid is painful. If the solution is non-irritating and deposited in loose tissue it will generally not produce any pain. Irritating injections, however, may be very painful, and even lead to destruction of tissue; hence the importance of a suitable preparation of the hypodermic solution. If an irritating injection cannot be avoided, it should be given "deep." By this is meant that the solution should be deposited in muscle instead of in the subcutaneous areolar tissue, which makes the injection less painful, as there are fewer sensory nerves in muscles, and less likely to produce an abscess on account of the better blood supply.

Another disadvantage is that, unless a trained nurse be in attendance, the physician himself must administer the dose, which is often a great inconvenience to both patient and physician. Nevertheless, the patient or his relatives should not be intrusted with the administration of hypodermic injections. Especially important is this injunction in case of morphine, as there is great danger of the establishment of the morphine habit in particularly vicious and enslaving form.

The dangers from hypodermic injection are (1) injection into a vein, (2) infection. Injection into a vein would carry the entire dose at once to the vital centers, giving a suddenness and severity of action that may not be desired. This is avoided by injecting into a part not well supplied with veins, such as the extensor surface of the arm or thigh. It is, furthermore, well to withdraw the needle slightly after it has been introduced

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and before injecting, which may withdraw the needle from a vein it had entered.

The second danger, infection, with all its possibilities of abscess formation, loss of limb, or even loss of life, can be avoided by surgical cleanliness—i. e., by removing any possibility of injecting beneath the skin those dangerous particles of living dirt, the disease-producing micro-organisms. Hence the solution, the syringe, and the part in which the injection is made must be sterile (free from living organisms). How this is attended to, will be discussed by giving directions in detail for hypodermic injection under the circumstances most commonly met with in private practice. See under hypodermic tablets in part II.

Hypodermoclysis is the injection of large quantities of fluid into the subcutaneous tissues. It is performed on the same principles and with the same precautions as the small subcutaneous injection; the procedure differing only in the use of a larger needle and a larger apparatus.

7. Intravenous Injection

Is the most certain and rapid method of introducing medicine into the system; it is also the most difficult and most dangerous. Air may be introduced into the vein, which might cause instant death. (?) The injury to the vein itself is likely to be followed by clotting of blood within it (*thrombosis*), with subsequent obliteration of the vein; there is also a possibility of septic inflammation of the vein (*phlebitis*). Many substances have the property of clotting the blood; and injection of such agents into the blood stream would result in the formation of solid foreign bodies in the circulation (*embolism*), the result of which might be disastrous.

Hence this method of administration is only to be resorted to in cases of emergency, as when extraordinary rapidity of action is necessary to save life (in poisoning, pernicious malaria) or when the circulation is almost failing, and so low that

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the mouth. The solution must be sterile and devoid of blood-coagulating qualities. The method differs from the hypodermic method in the following details: The vein, preferably one of the leg, is made prominent by dependent position and pressure above. The needle, separated from the syringe, is introduced into the vein; the sign that this is accomplished is the appearance of blood flowing from the open end. When the blood has commenced to flow from the needle, screw on the syringe, from which *all air has been expellel,* and inject very slowly. The difficulty of this method is the inserting of the needle into the vein. When the method given above fails, it becomes necessary to expose the vein by incising the skin.

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CHAPTER V.

PRESCRIPTION ETHICS.

1. Prescribing of Placebos.

A placebo (from Lat. *placere*, please) is a medicine adapted rather to pacify a patient's mind than to have any definite action upon the body. While a physician should have sufficient honesty and independence to do nothing, and to give nothing to a patient when that is for his best, there are patients whose disordered imagination tortures them with afflictions from which they suffer quite as truly as they would from any real ill. Such patients often cannot be convinced by any amount of assurance that their ailments are imaginary, while they may be cured of them by a few doses of an innocent remedy if it is given with the proper suggestion. It is as clearly our duty to employ such remedies as are likely to relieve the deluded imagination through psychic impression, as it is to give certain medicines for a well-defined disease. "It is the physician and not the remedy that cures."

Never send such a patient to a drug store with a prescription for bread pills, colored water, or anything else you know to be absolutely inert. It is not right to cause any one to pay money for articles that have no intrinsic value, nor is it wise to expose the nature of his infirmity even to the druggist. If you happen to have the appropriate remedy, give it gratuitously and charge for advice only; if not, write a prescription for something that has recognized though slight remedial value, and tends to act in the direction in which the patient's body may be influenced with most benefit.

2. "Specifying" in Prescriptions.

The physician's duty to his patient does not end with the visit, the examination, the diagnosis, and the prescription, but it also includes the responsibility for the proper execution of his orders. If the patient fails to obtain the remedy in good and active quality, our best directed efforts will not be crowned with suc-

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cess. Hence, whenever there is any reasonable doubt as to the quality of medicine the patient will obtain on our prescription, it is obviously our duty to specify either the pharmacist who is to compound the prescription, or the name of the manufacturer whose preparation is to be used.

Were all pharmacists equally honest and competent, and all medicines sold under the same name equally efficient, specifying would not only be unnecessary but even inexcusable, for it would display unfair favor and give ground for the accusation of collusion. We must admit, however, that there is a difference, and often a great difference, between various pharmacists as well as between various preparations bearing the same name. Therefore specifying becomes desirable, and at times even highly necessary.

Using a prescription blank with a certain pharmacist's name printed on it is clearly an endorsement of that particular pharmacist, and should mean a specification of his preparations. The matter of prescription blanks has, however, been so overdone by ambitious pharmacists and careless doctors, that patients rarely pay any attention to the pharmacist's name on the prescription blank unless the physician distinctly orders them to do so. Our prerogative of ordering our prescription to be taken to a certain pharmacist should be used with discretion, however, for evil minds may interpret our action in an unfavorable light.

If we desire to specify a certain manufacturer's preparation, we may do so by adding the maker's initials; or if it be a proprietary medicine by using its special name. In these cases, it is often good policy to prescribe a bottle-full, as the druggist, in order to insure himself against loss, must often charge as much for a smaller quantity as for the whole bottle.

We must here, however, warn against indiscriminate specifying, for thus particularizing not only reflects injuriously on every other manufacturer, but also puts the compounder to additional trouble and expense, as he might have several other varieties of the same article in stock, and yet be compelled by your specification to get another.

Above all, never prescribe a proprietary medicine whose com-

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for them are generally exorbitant. There are very few of them that are superior to combinations which an intelligent practitioner well versed in the art of prescribing can obtain with our standard and accepted agents of the pharmacopœia and the dispensatories at less than half the cost. By prescribing medicines whose composition you do not know you are liable to harm the patient; and are unable to accurately adjust the relative proportion of each ingredient to the condition of your patient. Such practice blocks all progress in therapeutics.

3. *Repeating of Prescriptions.*

When a pharmacist dispenses a prescription, he places on the label a number corresponding to the number which the prescription received according to his file; he also records on the label the date on which the medicine was dispensed. If it is desirable to have the prescription repeated, the physician should copy the number and date, sending the following order to the pharmacy where the prescription is on file:

Repete No. 16,718, d. Sept. 15, '05.

This order should be signed, like the original prescription, with the physician's name.

If a druggist refills a prescription without the order of the physician who wrote it, he does so on his own responsibility, and he has no legal nor moral right to place the physician's name on the container.

Unfortunately, this matter is not generally understood, and renewals are granted, on demand by the patient, without the knowledge of the physician; there being no rule against repeating prescriptions as often as may be desired by the patient. This is a serious condition of affairs, for great harm may be done by improper use of almost any active remedy. Many a life is wrecked by drug habits originating from the use of a prescription beyond the period intended by the prescriber. Conditions being as they are, when there is danger from improper repetition of the prescription, the physician should write at the bottom of the prescription, "Ne repetatur," or "Do not repeat."

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4. *The Ownership of the Prescription.*

To whom the prescription belongs is a mooted question. Patients are inclined to think that they have paid for the prescription, and that it is therefore their personal property. This, however, is a misconception of the very nature of a prescription. The written prescription is simply an order from physician to pharmacist. It is, because of custom and convenience, handed to the patient for transmission. While the patient has no legal or other right to demand a written order from the physician, it is right and proper for the druggist to demand that the order he is to fill should be in writing. The druggist who has prepared the remedy has at least the right of permanent guardianship (perhaps of outright possession) of the prescription, and he must keep it on file for reference and for any form of proper investigation in case of mistake or legal charge.

The patient has, of course, a right to do what he pleases with a prescription; he may not have it filled at all; but once the order has been filled by a properly authorized person, it passes into the hands of that individual. Should the patient request it, he may obtain from the pharmacist a copy of the prescription, which the patient may want for future reference, or because he may be obliged to get it refilled at another drug store on account of traveling. A druggist who accepts such a copy as order and fills it, does so on his own responsibility; for copies of the prescription have no standing in law.

When the prescription has left the physician's hand, he resigns all right to it. The patient or the druggist may even put it up as a patent medicine without the physician having any legal redress. They cannot, however, without his permission, use the name of its author in connection with it. Should they do so, the prescriber would have just cause for legally restraining the sale and even obtaining monetary reparation.

It should be pointed out, in this place, that it is considered unethical for a physician to hold patents on medicines; or to make a secret of any new medicine or combination of medicines he may discover. The physician's life work being not merely personal, but for the benefit of humanity, it is his duty to the public as well as to his professional brethren not to deprive them of any aid that lies in his power.

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5. *The Cost of the Prescription.*

It is necessary for the physician to be somewhat familiar with the prices charged by druggists for filling of prescriptions. For this reason we introduce the following:

TABLE OF PRICES.*

AVERAGE OF PRICES CHARGED IN THE VARIOUS SECTIONS OF THE UNITED STATES FOR PRESCRIPTIONS NOT REQUIRING EXTRAORDINARY SKILL OR CALLING FOR ANY VERY EXPENSIVE INGREDIENT.

Liquids.		Powders, Capsules or Pills.	
1 ounce,	$0.20—0.25	1 to 4,	$0.15—0.25
2 "	0.30—0.35	5 to 6,	0.25—0.30
3 "	0.35—0.40	8,	0.30—0.35
4 "	0.40—0.50	10,	0.35—0.40
6 "	0.60—0.65	12,	0.40
8 "	0.75	24,	0.50—0.75
12 "	1.00		
16 "	1.00—1.25		

Ointments.		Suppositories.	
½ ounce,	$0.25	½ dozen,	$0.40—0.50
1 "	$0.30—0.35	1 "	0.75—1.00
2 "	0.40—0.50		

It must, however, be understood that uniformity of prices does not exist in drug stores of this country. Hence if a patient asks the physician how much the prescription should cost, it is well to give a vague, rather than a definite answer.

If a prescription contains unusually expensive ingredients, the price will probably be higher than given in above table. In such cases it is well to tell the patient that the prescription will be rather expensive, so that the patient will not be surprised and cavil when the pharmacist tells him how much he

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cannot obtain. If the patient is poor and unable to pay full price for his medicines, the physician may write the Latin word *pauper* (poor) after the patient's name. If the patient is so poor as to be unable to pay anything at all, the word *pauperrimus*—very poor—will inform the druggist of the fact. Of course, it is not fair to thus tax the charity of the druggist unless the physician himself is also serving in the case gratuitously. Unnecessarily expensive medicines must be avoided in case of all poor patients.

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PART II.

PHARMACY.

The forms of medicines will be studied under this heading. Other things being equal, that physician will obviously be the most successful who has the most thorough knowledge of a great variety of forms in which to dispense his medicines so as to be able to best adapt them to the peculiarities of the patient and the disease.

The products of pharmacy may be divided into classes, each of which has its own title and its own peculiarities which must be thoroughly understood by the prescriber. These classes may be grouped according to common properties, as follows:

ORDER 1. Non-extractive Liquid Preparations.
ORDER 2. Extractive Preparations.
ORDER 3. Solid Preparations for Internal Use.
ORDER 4. External Preparations.

ORDER I. NON-EXTRACTIVE LIQUID PREPARATIONS.

These may be subdivided into:

Suborder A. Solutions.
Suborder B. Suspensions.

The solutions may be divided according to **the solvent used** into:

DIVISION 1. Aqueous Solutions, including:
Class 1. Waters.
Class 2. Solutions.
Class 3. Syrups.
Class 4. Honeys.
Class 5. Mucilages.

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Division 2. Alcoholic Solutions.
Class 1. Spirits.
Class 2. Elixirs.

Division 3. Glycerin Solutions.
Class 1. Glycerites.

The suspensions may be divided according to the nature of the suspended substance into:

Class 1. Mixtures.
Class 2. Emulsions.

SUBORDER A. SOLUTIONS.

ON SOLUTION IN GENERAL.

A solution may be defined as the blending together of two bodies to form a clear liquid. Every solution, therefore, consists of two parts, the *solute,* which may be gas, liquid, or solid, and the *solvent,* which is always liquid.

The proportion which the solvent must bear to the solute in order that it may just dissolve, is known as the *solubility* of the latter; and is constant for each substance under particular conditions, the most important of which is temperature. A *saturated solution* is one which contains all of a solute that the solvent will dissolve at a certain temperature; but a solution saturated at one temperature is either supersaturated or subsaturated at all other temperatures. As a general proposition, substances are more soluble in hot liquids than in cold; one important exception to this rule occurs in case of gases: these are more soluble in cold than in hot liquids. The amount of a gas which will remain in solution is also dependent upon pressure. It is directly proportional to the pressure. Familiar examples of solutions of gases under presure are the aërated table and mineral waters and "soda-water." All of these solutions effervesce as soon as the pressure is withdrawn because the solution becames thereby supersaturated, and a portion of the gas escapes. The figures on solubility given in this and

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A knowledge of the solubility of the substances used in medicine is a most important and necessary acquisition on the part of the medical student, for upon it depends his ability to decide whether a substance should be prescribed in liquid or in solid form, what solvent and how much of it must be added to make a clear solution, etc. Incompatibility is to a great extent a question of solubility. Indeed, the taste, the action and the uses of drugs depend in first instance upon their solubility; for drugs insoluble in saliva are tasteless; and agents insoluble in the cell liquids cannot permeate cells and, therefore, cannot act upon them in any direct manner.

Unfortunately the solubility of each substance must be learned separately; though helpful generalizations can be formulated on the solubility of groups of substances. A few of the widest generalizations on solubility may be given here.

RULE 1. All bodies, whether solid, liquid, or gaseous, can be dissolved in some liquid, but none are soluble in all liquids.

RULE 2. Substances that are soluble in water are usually insoluble in oils and in the liquids that dissolve oils: namely ether, chloroform, benzin, benzol, volatile oils, carbon disulphide. Substances soluble in oils and in the solvents of oils are usually insoluble in water.

RULE 3. Solubility is determined to some extent by chemical analogies of solute and solvent; e. g., all alcohols are soluble in alcohol, all organic acids in acetic acid, all metals in mercury or in other metals in the fused state (amalgams, alloys). Water has a greater use in dissolving inorganic than organic substances; alcohol and other organic solvents dissolve organic substances better than most inorganic bodies.

RULE 4. Where several substances are dissolved in the same liquid, the solubility of each is lowered, except in cases in which a chemic change takes place resulting in the formation of a double salt which may be very soluble, e. g., red iodide of mercury which is quite insoluble in water, becomes readily soluble by the addition of potassium iodide.

RULE 5. When solutions of any two substances are mixed capable by interchange of ions to form a volatile or an insoluble substance, that substance is produced and expelled from the solution. This is known as the "law of transposition."

RULE 6. A solution (of liquids as well as of solids) always

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measures more than the liquid used to make it, but not as much as the sum of the bulk of its constituents. Thus 1Kg. of sugar dissolved in 1L. of water will measure more than 1L. but less than 2L. Hence, as in prescribing solutions, we usually desire to have the product measure a certain exact amount, and because the loss in volume occurring in solution cannot be calculated, we usually order a sufficient quantity (*q. s.*) of the solvent to be added to make the solution measure a specified amount.

The process of solution requires time; it is hastened by the following three factors: 1. A fine state of subdivision of the solute which favors solution by presenting a larger surface to the solvent. 2. Agitation, which brings the solute in contact with fresh portions of the solvent. 3. Heat, which increases the solubility of substances (with few exceptions). Of course, if by heat the solution is made to contain more of a solute than will dissolve at ordinary temperature, the excess of solute will be deposited as the hot solution cools.

DIVISION 1.

AQUEOUS SOLUTIONS.

Water is the most important of all solvents; it has the advantage of very wide applicability, of being devoid of any pharmacologic action, and of being cheap. In ordering it in prescriptions, we must bear in mind the difference between ordinary water and distilled water. **Natural water** (*aqua*, gen. *aquae*), even in its purest attainable state, is never absolutely pure; it contains traces of gases and of various salts, which, while they do not impair its usefulness for most ordinary purposes, cause decomposition of various delicate chemicals such as silver nitrate, corrosive mercuric chloride, potassium permanganate, lead acetate, etc. Hence, the solvent that should be used for such substances is **distilled water,** (*aqua destillata,** gen. *aquae destillatae.*) It is the custom with many physicians to order distilled water in every prescription in which water is used; they are certainly on the safe side.

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edly acid or basic gases, e. g., HCl, NH_3, are quite freely soluble. Among liquids, alcohol and glycerin are mixible with water; ether, chloroform, volatile oils, benzene slightly soluble; fixed oils and petroleum benzin insoluble in water. Among solids, inorganic substances are more generally soluble in water than organic substances. Sugars, gums and albumen are some of the most important examples of organic substances soluble in water, and insoluble in alcohol. The greatest drawback to the use of water as solvent for organic substances lies in the fact that watery solutions of organic substances do not keep on account of fermentation or putrefaction. On the other hand, watery solutions of inorganic substances, or of organic substances with antiseptic property, are not so subject to change on keeping, and this is one of the reasons for the usefulness of the following two classes of official preparations, the waters and the solutions.

CLASS I. AQUAE. WATERS. MEDICATED WATERS.

NOM.—*Aqua;* gen., *aquae;* abbr., *aq.;* gender, female.

PRONUNCIATION.—A′-kwah; gen., a′-kwe.

DEFINITION.— **Aqueous solutions of volatile substances.** Two very dissimilar classes of preparations come under this heading: group 1, aromatic waters; group 2, chemical waters.

GROUP 1. **The aromatic waters** are saturated solutions of volatile oils and analogous substances. As volatile oils are but very slightly soluble in water, the aromatic waters are weak preparations. The quantity that dissolves is just large enough to give these waters a pleasant flavor without imparting to them notable therapeutic properties. Hence their dose is large; ranging from 4 to 16 Cc. They are mainly used as pleasant vehicles.

Prepare as example:

AQUA CINNAMOMI. CINNAMON WATER.

Oil of cinnamon,	0,06 Cc.
Purified talc,	0,45 Gm.
Distilled water, a sufficient quantity to make	30,00 Cc.

Triturate* the oil of cinnamon with the purified talc, add the distilled water gradually with continued trituration, filter, and

* Trituration is the process of rubbing a substance in a mortar.

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pass the filtrate through the filter repeatedly until the cinnamon water is perfectly clear. Preserve in a bottle and label with official name.

The object of this process is to increase the surface of oil exposed to the solvent by distributing it over purified talc, an inert and insoluble substance, thereby facilitating solution.

By substituting other volatile oils, such as oil of peppermint, oil of anise, or oil of fennel, for the oil of cinnamon in above formula, the corresponding aromatic water may be obtained. Aromatic waters prepared by distillation from the fresh drug have a finer flavor than those obtained by the above process. Hence in case of the most delicate flavors, such as rose water and orange flower water, the pharmacopœia directs that they should be prepared by distillation.

The following aromatic waters are official:

	Av. Dose.
Aqua amygdalae amarae, Bitter almond water,	4,00 Cc.
Aqua anisi, Anise water,	16,00 Cc.
Aqua aurantii florum, Orange flower water,	16,00 Cc.
Aqua aurantii florum fortior, Stronger orange flower water,	8,00 Cc.
Aqua camphorae, Camphor water,	8.00 Cc.
Aqua chloroformi, Chloroform water,	16,00 Cc.
Aqua cinnamomi, Cinnamon water,	16,00 Cc.
Aqua creosoti, Creosote water,	8,00 Cc.
Aqua foeniculi, Fennel water,	16,00 Cc.
Aqua hamamelidis, Hamamelis water (cont. 15 % alcohol)	8.00 Cc.
Aqua menthae piperitae, Peppermint water,	16,00 Cc.
Aqua menthae viridis, Spearmint water,	16,00 Cc.
Aqua rosae, Rose water,	16,00 Cc.
Aqua rosae fortior, Stronger rose water,	8,00 Cc.

Examine specimens of some of these elegant flavoring liquids.

GROUP 2. **The chemical waters** are aqueous solutions of volatile chemicals. They are strong preparations, of marked activity, and are given in small doses. The following are official:

	Strength.	Av. Dose.
Aqua ammoniae, Ammonia water.	10%	1,00 Cc.
Aqua ammoniae fortior,	28%	

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Practice in Prescription-Writing.

PROBLEM 27. Prescribe astringent lotion in conjunctivitis. Zinc sulphate, 1/5%; boric acid, 1% in 30,0 Cc. of rose water. Directions: Two drops in each eye every two hours.

PROBLEM 28. Urinary antiseptic in cystitis. 15 doses of hexamethylenamine 0,5 Gm. dissolved in teaspoonful of peppermint water. Dose: Teaspoonful in tumblerful of carbonated water every 8 hours.

PROBLEM 29. For hemorrhoids. Prescribe 240 Cc. of hamamelis water. Small syringeful to be injected frequently.

CLASS 2. LIQUORES. SOLUTIONS.

NOM.—*Liquor;* gen., *liquoris;* abbr., *liq.;* gender, male.

PRONUNCIATION.—Li'-kwor; gen., li-kwo'-ris.

DEFINITION.—**Aqueous solutions containing non-volatile substances.**

Origin of name.—The Latin title *liquor* simply means liquid; while the English name solution, from Latin *solutio,* means a liquid holding something in solution; hence the latter is a more appropriate and expressive title than the former.

These solutions have various uses. Some of them contain chemicals that could not as well be kept in the dry form; others furnish a convenient aqueous solution of substances not readily soluble in water; a number of them afford a pleasant method of administration; while the utility of many lies in the convenience of measuring relatively large volumes of solution as compared with weighing a small quantity of solid. Most of them are very active, some even poisonous; hence can only be given in small doses.

The official solutions may, for purposes of study, be divided into several groups:

GROUP 1. Halogen solutions.
GROUP 2. Alkali solutions.
GROUP 3. Solutions of salts of light metals.
GROUP 4. Solutions of salts of heavy metals.
GROUP 5. Organic antiseptic solutions.

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GROUP 1. **The halogen solutions** are:

	Composition	Gm. in 100 Cc.	Av. Dose.
Liquor iodi compositus, Compound solution of iodine. (Syn. Lugol's solution.)	Iodine,	5,00	
	Potassium iodide,	10,00	0,20 Cc.
Liquor chlori compositus, Compound solution of chlorine. (Syn. Chlorine water.)	Chlorine,	0,40	
	Oxides of chlorine, Potassium chloride,		4,00 Cc.
Liquor sodae chlorinatae, Solution of chlorinated soda. (Syn. Labarraque's solution.)	Available chlorine, in form of several unstable sodium compounds,	2,40	1,00 Cc.

GROUP 2. **The alkali solutions** are:

Liquor calcis, Solution of calcium hydroxide, Lime water.	Calcium hydroxide,	0,14	16,00 Cc.
Liquor potassii hydroxidi, Solution of potassium hydroxide.	Potassium hydroxide,	5,00	1,00 Cc.
Liquor sodii hydroxidi, Solution of sodium hydroxide.	Sodium hydroxide,	5,00	1,00 Cc.

GROUP 3. **The solutions of the salts of the light metals** differ from most other official solutions, excepting lime water and the antiseptic solution, in being quite non-toxic and in being given in comparatively large doses. They are as follows:

	Composition.	Gm. in 100 Cc.	Av. Dose.
Liquor ammonii acetatis, Solution of ammonium acetate. (Syn. Spirit of Mindererus.)	Ammonium acetate,	7,00	16,00 Cc.
Liquor magnesii citratis, Solution of magnesium	Magnesium carbonate,	4,17	
	Citric acid,	9,17	

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Liquor sodii phosphatis compositus, Compound solution of sodium phosphate.	Sodium phosphate,	100,00	
	Sodium nitrate,	4,00	
	Citric acid,	13,00	
	Water, to make,	100,00	8,00 Cc.

The first two of these solutions are examples of so-called "**neutral mixtures**" (Lat. *saturatio,—onis*, f.) which are solutions of a carbonate or bicarbonate neutralized with an acid. The carbonic acid gas liberated by the reaction is partly retained in solution in the water, rendering the preparation more grateful to the taste and more acceptable to the stomach. As this gas is gradually given off on keeping, these solutions should always be freshly prepared.

Prepare as example:

LIQUOR AMMONII ACETATIS. SOLUTION OF AMMONIUM ACETATE.

Ammonium carbonate,	1,5 Gm.
Diluted acetic acid,	30,0 Cc.

Add the ammonium carbonate (which should be in translucent pieces) gradually to the cold diluted acetic acid, and stir until it is dissolved.

The **solution of magnesium citrate** is an effervescing solution, which differs from the neutral mixtures in that it gives off a large quantity of carbonic acid gas just before the dose is taken, thereby insuring saturation with gas and freshness of the preparation. This is secured by preserving under pressure all the gas given off in the reaction by bottling immediately in strong bottles that are then tightly corked.

GROUP 4. **Solutions of salts of the heavy metals.**

Subgroup a. **The arsenic solutions** are all of the same strength, viz. 1%; 1 Cc. representing 0,01 Gm. of arsenic. Their average dose is 0,2 Cc.

	Composition.	Gm. in 100 Cc.	Av. Dose.
Liquor acidi arsenosi, Solution of arsenous acid.	Arsenic trioxide,	1,00	
	Dil. hydrochloric acid,	5,00	0,20 Cc.
Liquor potasii arsenitis, Solution of potassium arsenite. (Syn. Fowler's solution.)	Arsenic trioxide,	1,00	
	Potassium bicarbonate,	2,00	0,20 Cc.
	Comp. tinct. lavender,	3,00	

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	Composition.	Gm. in 100 Cc.	Av. Dose.
Liquor sodii arsenatis, Solution of sodium arsenate. (Syn. Pearson's solution.)	Sodium arsenate,	1,00	0,20 Cc.
Liquor arseni et hydrargyri iodidi, Solution of arsenous and mercuric iodides. (Syn. Donovan's solution.)	Arsenous iodide,	1,00	
	Red mercuric iodide,	1,00	0,10 Cc.

Subgroup b. **The iron solutions:**

	Composition.	Gm. in 100 Cc.	Av. Dose.
Liquor ferri chloridi, Solution of ferric chloride.	Ferric chloride,	29,00	0,10 Cc.
Liquor ferri et ammonii acetatis, Solution of iron and ammonium acetate. (Syn. Basham's mixture.)	Tincture ferric chloride,	4,00	
	Diluted acetic acid,	6,00	
	Solution ammonium acet,	50,00	
	Aromatic elixir,	12,00	
	Glycerin,	12,00	
	Water, to make,	100,00	16,00 Cc.
Liquor ferri subsulphatis, Solution of ferric subsulphate. (Syn. Monsel's solution.)	Ferric subsulphate,	43,70	0,20 Cc.
Liquor ferri tersulphatis, Solution of ferric sulphate.	Ferric sulphate,	36,00	

Subgroup c. **Solutions of various heavy metals for external use only:**

	Composition.	Gm. in 100 Cc.
Liquor hydrargyri nitratis, Solution of mercuric nitrate.	Mercuric nitrate,	60,00
	Nitric acid,	11,00

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Liquor zinci chloridi, Solution of zinc chloride.	Zinc chloride,	50,00

GROUP 5. **Organic antiseptic solutions:**

	Composition.	Gm. in 100 Cc.	Av. Dose.
Liquor antisepticus, Antiseptic solution.	Boric acid,	2,00	
	Benzoic acid,	0,10	
	Thymol,	0,10	
	Eucalyptol,	0,025	4,00 Cc.
	Oil peppermint,	0,05	
	Oil gaultheria,	0,025	
	Oil thyme,	0,01	
	Alcohol,	25,00	
Liquor cresolis compositus, Compound solution of cresol.	Cresol,	50,00	
	Linseed oil,	35,00	
	Potassium hydroxide,	8,00	
Liquor formaldehydi, Solution of formaldehyde.	Formaldehyde,	37,00	

Practice in Prescription-Writing.

PROBLEM 30. Diaphoretic in fever. Prescribe 15 doses of solution of ammonium acetate 15 Cc. Dose to be taken in sweetened water every two hours.

PROBLEM 31. Effervescing saline purgative. Write prescription for one bottle of solution of magnesium citrate, the contents of which are to be taken at one dose on rising in the morning.

PROBLEM 32. Gargle in follicular tonsillitis. Prescribe equal parts of solution of hydrogen dioxide and the antiseptic solution to be used as gargle every half hour.

CLASS 3. SYRUPI. SYRUPS.

NOM.—*Syrupus;* gen., *syrupi;* abbr., *syr.;* gender, male.

PRONUNCIATION.—Lat. sir-u'-pus; gen., sir-u'-pi. Eng., sir'-up.

ORIGIN OF NAME.—From Arabian *shurab*, a beverage.

DEFINITION.—**Nearly saturated solutions of sugar in aqueous liquids.**

Their special value lies in the following properties of sugar: 1. Its pleasant taste; 2. Its action as a preservative.

1. On account of their sweet taste, which is pleasant to most people, especially to children, syrups are among our most impor-

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tant flavoring agents furnishing means of administering many disagreeable remedies in a palatable form.

2. While dilute solutions of sugar ferment quickly unless preserved by special means, a fully saturated solution is not only quite stable, but even capable of preserving other substances from fermentation, probably because sugar by its great affinity for water renders unavailable the moisture necessary for the development of microorganisms. Sugar forms, furthermore, an excellent preservative for certain unstable chemicals such as hydriodic acid, ferrous iodide, hypophosphites, etc., inhibiting chemic change probably by reason of its own chemic sluggishness.

Prepare as example :

SYRUPUS AURANTII FLORUM. SYRUP OF ORANGE FLOWERS.	
Sugar	25,5 Gm.
Orange flower water, a sufficient quantity to make	30,0 Cc.

Prepare a percolator or funnel by gently pressing into its neck a pledget of purified cotton, which is then moistened with a few drops of distilled water; introduce the sugar into the percolator, make its surface level without shaking or jarring, then carefully pour upon it 13,5 Cc. of orange flower water. The liquid that drops from the lower orifice is known as the percolate. Return the first portions of the percolate until it runs through clear, and, when all the liquid has passed, follow it by orange flower water, added in portions, so that all the sugar may be dissolved, and the product measure 30,0 Cc. Mix thoroughly. Preserve in bottle, and label with official name.

The process by which this syrup has been prepared is known as percolation. It is the most convenient method of preparing syrups. The sugar may also be dissolved by simple shaking; but, solution being slow, a good deal of agitation is required. Heat may be used to hasten the solution of the sugar in the preparation of syrups whose ingredients are not volatile

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GROUP 1. **The flavoring syrups** are mainly used as pleasant vehicles. Their dose is large; they may be used in almost any quantity; they are usually administered in doses of 4 to 16 Cc. When used for flavoring, syrups should, as a rule, not form more than one-half of the volume of the dose, else the medicine will be too sweet. Dilution of the syrup may be obtained by prescribing it with an equal quantity of water; this, however, renders the medicine very prone to spoil unless ingredients are present that are endowed with antiseptic property. Unless such ingredients are present, it is usually best to direct the patient to add the water just before the dose is taken. Cough syrups, on the other hand, are generally most efficient when administered without dilution, their viscidity causing them to cling to the throat and soothe its irritation, often lessening cough by that action alone. The following flavoring syrups are official:

	Composition	Gm. in 100 Cc. of syrup, unless otherwise specified.	Av. Dose.
Syrupus, Syrup.	Sugar, Water, enough for	85,00 100,00	
Syrupus acaciae, Syrup of acacia.	Acacia,	10,00	
Syrupus acidi citrici, Syrup of citric acid.	Citric acid, Tinct. of lemon peel,	1,00 1,00	
Syrupus amygdalae, Syrup of almond.	Spirit of bitter almond,	1,00	4,00 Cc.
Syrupus aurantii, Syrup of orange.	Citric acid, Tinct. of sweet orange peel,	0,50 5,00	
Syrupus aurantii florum, Syrup of orange flowers.	Sugar, Orange flower water, to	85,00 100,00	
Syrupus rosae, Syrup of rose.	Fluidextract of rose, Diluted sulphuric acid,	12,50 1,00	
Syrupus sarsaparillae compositus, Compound syrup of sarsaparilla.	Fluidext. sarsap., Fluidextract glycyrrhiza, Fluidextract senna, Oil of sassafras, Oil of anise, Oil of gaultheria,	20,00 1,50 1,50 0,02 0,02 0,02	16,00 Cc.
Syrupus tolutanus, Syrup of tolu.	Tincture of tolu,	5,00	16,00 Cc.

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Syrupus zingiberis, Syrup of ginger.	Fluidextract of ginger,	3,00	16,00 Cc.

GROUP 2. The following **medicated syrups** are official:

	Composition.	Gm. in 100 Cc.	Av. Dose.
Syrupus acidi hydriodici, Syrup of hydriodic acid.	Hydriodic acid,	1,00	4,00 Cc.
Syrupus calcii lactophosphatis, Syrup of calcium lactophosphate.	Calcium lactophosphate,	1,00	8,00 Cc.
Syrupus calcis, Syrup of lime.	Lime,	6,50	2,00 Cc.
Syrupus ferri iodidi, Syrup of ferrous iodide.	Ferrous iodide,	6,74	1,00 Cc.
Syrupus ferri, quininae et strychninae phosphatum, Syrup of the phosphates of iron, quinine, and strychnine.			4,00 Cc.
	Soluble iron phosphate,	2,00	
	Quinine,	3,00	
	Strychnine,	0,02	
Syrupus hypophosphitum, Syrup of hypophosphites.	Calcium hypophosphite,	4,50	
	Potassium hypophosphite,	1,50	8,00 Cc.
	Sodium hypophosphite,	1,50	
Syrupus hypophosphitum compositus, Compound syrup of hypophosphites.	Calc. hypophosphite,	3,50	
	Potassium hypophosphite,	1,75	
	Sodium hypophosphite,	1,75	
	Ferric hypophosphite,	0,225	
	Manganese hypophosphite,	0,225	
	Quinine,	0,110	8,00 Cc.
	Strychnine,	0,0115	
Syrupus ipecacuanhae, Syrup of ipecac.	Fluidextract of ipecac,	7,00	
	Dose — expectorant, 1Cc.: emetic, 15Cc.		
Syrupus krameriae, Syrup of krameria.	Fluidextract of krameria,	45,00	4,00 Cc.
Syrupus lactucarii, Syrup of lactucarium.	Tincture of lactucarium,	10,00	8,00 Cc.
Syrupus picis liquidae, Syrup of tar.	Tar,	0,50	4,00 Cc.
Syrupus pruni virginianae, Syrup of wild cherry.	Wild cherry,	15,00	4,00 Cc.
Syrupus rhei, Syrup of rhubarb.	Fluidextract of rhubarb,	10,00	8,00 Cc.
Syrupus rhei aromaticus, Aromatic syrup of rhubarb.	Arom. tinct. rhubarb,	15,00	8,00 Cc.
Syrupus rubi, Syrup of rubus.	Fluidextract of rubus,	25,00	4,00 Cc.
Syrupus scillae, Syrup of squill.	Vinegar of squill,	45,00	2,00 Cc.

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Syrupus scillae compositus, Compound syrup of squill. (Syn. Coxe's hive syrup.)	Fluidextract of squill,	8,00	
	Fluidextract of senega,	8,00	2,00 Cc.
	Antim. and potass. tart.,	0,20	
Syrupus senegae, Syrup of senega.	Fluidextract of senega,	20,00	4,00 Cc.
Syrupus sennae, Syrup of senna.	Fluidextract of senna,	25,00	
	Oil of coriander,	0,50	4,00 Cc.

It will be noted that the doses of most medicated syrups range mainly between 4 and 8 Cc., excepting the doses of syrup of lime, of iron iodide, of ipecac, of squill, and compound syrup of squill, the doses of which range from 1 to 2 Cc.

Incompatibilities of syrups. The syrups are freely mixable with water and aqueous liquids, but if added in concentrated form to strong alcoholic liquids, the sugar gradually crystallizes out of solution as it is much less soluble in alcohol than in water. Being concentrated solutions, syrups will dissolve but a small quantity of other substances; if it is necessary to dissolve a large quantity, a sufficient amount of water should be added. The following syrups are acid, hence have the incompatibilities of acids: syrups of hydriodic acid, citric acid, squill, and of rose. Syrups with alkaline reaction are: syrup of rhubarb, syrup of senega; these have the incompatibilities of alkalies.

CLASS 4. MELLITA. HONEYS.

NOM.—*Mel.*, gen., *mellis;* gender, neuter.

DEFINITION.—Sweet viscid liquids, differing from syrups merely by making use of the saccharine secretion of the bee, instead of an artificial sugar solution.

The honeys are sometimes used in prescriptions as pleasant vehicles, as a syrup would be; they have, however, no advantage over syrups. Only three honeys are official:

	Av. Dose.
Mel, Honey,	4,00 Cc.
Mel depuratum, Clarified honey,	4,00 Cc.
Mel rosae, Honey of rose, (fluidextract of rose, 12 %.)	4,00 Cc.

Practice in Prescription-Writing.

PROBLEM 33. Cough Syrup. Prescribe 15 doses of ammonium chloride 0,3 Gm. in teaspoonful of syrup of tolu. Dose to be taken every two hours.

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PROBLEM 34. Alterative. Prescribe 30 doses of potassium iodide 0,3 Gm. in aqueous solution flavored with compound syrup of sarsaparilla. Teaspoonful in water to be taken three times daily after meals.

PROBLEM 35. In lead colic. 8 doses of following composition each: Alum, 1,0 Gm.; dilute sulphuric acid, 0,5 Gm.; syrup of citric acid, as flavor; water, enough for solution. Will dose be a teaspoonful or a tablespoonful? Dose to be taken every hour or two.

CLASS 5. MUCILAGINES. MUCILAGES.

NOM.—*Mucilago;* gen., *mucilaginis;* gender, female.

PRONUNCIATION.—Mu-sil-a'-go.

DEFINITION.—**Thick, sticky solutions of gum in water.**

PREPARATION.—They are prepared by dissolving gum in water, or by extracting the mucilaginous principles from vegetable substances.*

USES.—They are used as demulcents, as emulsifying or as suspending agents, and as excipients. These uses will be discussed further on in their appropriate places. The doses of mucilages are large; the pharmacopœia places their average dose at 16 Cc.

The following mucilages are official:

	Composition.	Gm. in 100 Cc.	Av. Dose.
Mucilago acaciae, Mucilage of acacia.	Acacia,	34,00	
	Lime water,	33,00	16,00 Cc.
Mucilago sassafras medullae, Mucilage of sassafras pith.	Sassafras pith,	2,00	16,00 Cc.
Mucilago tragacanthae, Mucilage of tragacanth.	Tragacanth,	6,00	
	Glycerin,	18,00	16,00 Cc.
Mucilago ulmi, Mucilage of elm.	Elm,	6,00	16,00 Cc.

INCOMPATIBILITIES.—As gums are insoluble in alcohol, mucilages and all other liquids containing gum are incompatible with strong alcoholic liquids.

* Hence some of the mucilages should be classified with the extractive preparations; this would, however, increase the complexity of the classification without commensurate advantage.

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Mucilages spoil quickly by fermentation; they should, therefore, be freshly made when wanted. The change may be retarded by adding antiseptics, e. g., glycerin 10%, or chloroform 0.5%, or solution of formaldehyde 0,1.%

Practice in Prescription-Writing.

PROBLEM 36. Against vomiting. 8 doses, each to consist of carbolic acid, 0,03 Gm.; bismuth subnitrate, 1,00 Gm.; mucilage of acacia, enough for suspension; peppermint water, enough for tablespoonful. Dose every two to four hours as needed.

DIVISION 2.

ALCOHOLIC SOLUTIONS.

Alcohol ranks next to water in importance as a solvent. It dissolves iodine, phosphorus, acids, many metallic salts, and most organic bodies.

While many metallic salts are soluble in alcohol, water is a better solvent for them as will be seen from the following rules:

1. Most of the nitrates and halogen salts, as well as those of many of the organic acids, are soluble in alcohol, while nearly all others are insoluble, except deliquescent salts.

2. Metallic salts are generally more freely soluble in water than in alcohol (exceptions $HgCl_2$, HgI_2) hence alcohol should not be added to strong salt solutions.

3. Metallic salts soluble in alcohol are also soluble in water (exception HgI_2); but salts soluble in water are not necessarily soluble in alcohol.

Most organic bodies (except carbohydrates and proteids) are dissolved by alcohol, and most of these are thrown out of solution by diluting with water. Alcohol is a good preservative, which still further increases its value as a solvent for organic substances. Its burning taste necessitates dilution of all strongly alcoholic liquids before taking them. It has distinct pharmacologic properties which may or may not be desirable.

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CLASS 1. SPIRITUS. SPIRITS.

NOM.—*Spiritus;* gen., *spiritus;* abbr., *spir.*, gender, **male.**

PRONUNCIATION.—Spir'-it-us.

DEFINITION—**Alcoholic solutions of volatile substances.** Alcoholic solutions containing non-volatile substances are known as tinctures. Spirits are the alcoholic analogues of the waters; and, like the waters, spirits may be divided into two groups: group 1, aromatic spirits; group 2, chemical spirits.

GROUP 1. **The aromatic spirits,** also known as essences, are solutions of volatile oils or analogous aromatic principles in alcohol. They differ from the aromatic waters in being strong preparations, and not weak ones; for alcohol dissolves volatile oils freely. Spirits are, therefore, not only useful as flavoring agents for alcoholic liquids, but are also capable of acting as medicaments. The following aromatic spirits are official:

	Composition.	Gm. or Cc. in 100 Cc. of alcohol, unless otherwise specified.	Av. Dose.
Spiritus amygdalae amarae, Spirit of bitter almond.	Oil of bitter almond, Distilled water,	1,00 19,00	0,50 Cc.
Spiritus anisi, Spirit of anise.	Oil of anise,	10,00	4,00 Cc.
Spiritus aurantii compositus, Compound spirit of orange.	Oil of orange peel, Oil of lemon, Oil of coriander, Oil of anise,	20,00 5,00 2,00 0,50	
Spiritus camphorae, Spirit of camphor.	Camphor,	10,00	1,00 Cc.
Spiritus cinnamomi, Spirit of cinnamon.	Oil of cinnamon,	10,00	2,00 Cc.
Spiritus frumenti, Whisky.	Distilled from the mash of fermented grain, 44-55% by volume of absolute alcohol.		

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Spiritus juniperi compositus, Compound spirit of juniper. (Corresponds to gin.)	Oil of juniper,	0,40	
	Oil of caraway,	0,05	
	Oil of fennel,	0,05	8,00 Cc.
	Water,	30,00	
Spiritus lavandulae, Spirit of lavender.	Oil of lavender flowers,	5,00	2,00 Cc.
Spiritus menthae piperitae, Spirit of peppermint.	Oil of peppermint,	10,00	
	Peppermint,	1,00	2,00 Cc.
Spiritus menthae viridis, Spirit of spearmint.	Oil of spearmint,	10,00	
	Spearmint,	1,00	2,00 Cc.
Spiritus vini gallici, Brandy.	Distilled from fermented grape juice, 46-55% by volume of absolute alcohol.		

GROUP 2. **The chemical spirits** are alcoholic solutions of volatile chemicals. They are active medicines.

Spiritus ætheris, Spirit of ether.	Ether,	32,50	4,00 Cc.
Spiritus ætheris compositus, Compound spirit of ether. (Syn. Hoffman's anodyne.)	Ether,	32,50	
	Ethereal oil,	2,50	4,00 Cc.
Spiritus ætheris nitrosi, Spirit of nitrous ether. (Syn. Sweet spirit of nitre.)	Ethyl nitrite,	4,00	2,00 Cc.
Spiritus ammoniae, Spirit of ammonia.	Ammonia,	10,00	1,00 Cc.
Spiritus ammoniae aromaticus, Aromatic spirit of ammonia.	Ammonium carbonate,	3,40	
	Ammonia water,	9,00	
	Oil of lemon,	1,00	
	Oil of lavender flowers,	0,10	2,00 Cc.
	Oil of nutmeg,	0,10	
	Distilled water,	20,00	
Spiritus chloroformi, Spirit of chloroform.	Chloroform,	6,00	2,00 Cc.
Spiritus glycerylis nitratis, Spirit of glyceryl trinitrate. (Spirit of nitroglycerin.)	Glyceryl trinitrate,	1,00	0,05 Cc.

Spirits were formerly made by distillation. At present only whisky and brandy are thus prepared. The others are made by solution of the volatile substance in alcohol.

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Prepare as example:

SPIRITUS AMMONIAE AROMATICUS—AROMATIC SPIRIT OF AMMONIA.

Ammonium carbonate	1.02	Gm.
Ammonia water,	2,70	Cc.
Oil of lemon,	0,30	Cc.
Oil of lavender flowers,	0,03	Cc.
Oil of nutmeg,	0,03	Cc.
Alcohol,	21,00	Cc.
Distilled water, a sufficient quantity to make	30,00	Cc.

To the ammonia water, contained in a flask, add 4,2 Cc. of distilled water, and afterward the ammonium carbonate reduced to a moderately fine powder. Close the flask and agitate the contents until the ammonium carbonate is dissolved (and allow it to stand for twelve hours.*). Into another bottle introduce the alcohol, add first the oils, then gradually the solution of ammonium carbonate, and afterwards enough distilled water to make the product measure 30,0 Cc. Set the liquid aside during 24 hours (or longer), occasionally agitating, then filter through paper. Preserve in a bottle, and label with official name.

Incompatibilities of spirits.—Water causes a separation of the volatile substances in all the official spirits, except in the spirit of ether, of nitrous ether, ammonia, and in whisky and brandy.

Being strongly alcoholic, spirits are good solvents for resins, oleoresins, and resinous extracts; and they do not cause precipitation when added to strongly alcoholic fluid extracts and tinctures.

Administration.—It will be noted that the **dose** of spirits ranges mainly between 1 to 2 Cc., with the important exception of the spirit of glyceryl trinitrate, the average dose of which is 0,05 Cc. While spirits should, as a general proposition, not be diluted with water in a prescription, they are too strongly alcoholic to be taken undiluted; they should be administered in water, which may be sweetened; or they may be dropped on a lump of sugar (hence they are sometimes called "drops").

* Allow to stand for half hour, if laboratory time does not permit the full carrying out of the official directions.

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Practice in Prescription-Writing.

PROBLEM 37. For palpitation, precardial pain, and cardiac irregularity of functional origin. 15 doses compound spirit of ether, aromatic spirit of ammonia, of each 2,0 Cc.; spirit of camphor, 1 Cc.; compound tincture of lavender, enough for dessertspoonful. Dose to be taken in a little water every quarter of an hour until the attack is relieved.

PROBLEM 38. For colic. 15 doses of equal parts of spirit of chloroform and compound tincture of cardamom. Teaspoonful in water every half hour until relieved.

PROBLEM 39. Diuretic for incontinence of urine in children. 30 doses of Potassium acetate, 0,5 Gm.; spirit of nitrous ether, 1,0 Cc.; water enough for teaspoonful. Dose to be taken in water every 4 hours until the urine becomes light colored.

CLASS 2. ELIXIRES. ELIXIRS.

NOM.—*Elixir;* gen., *elixiris;* abbr., *elix.;* gender, neuter.

PRONUNCIATION.—E-liks'-er.

ORIGIN OF NAME.—From the Arabic *el*, the, and *iksir*, philosopher's stone; *iksir* probably derived from the Gr. *xeros*, dry, i. e., the powder, so much sought after by the alchemists, a pinch of which would convert a whole mass of base metal into gold, and which in minute doses would prolong life and restore youth. Later it was used to designate any compound preparation of supposed sublime properties.

DEFINITION.—**Aromatic sweetened alcoholic preparations in which medicament may be dissolved.**

The first object aimed at in the modern elixir is an agreeable taste. By means of it the taste of nauseous medicines may often be rendered less disagreeable. Containing 25% of alcohol, elixirs combine to a certain extent the solvent powers of alcohol and of water; thus they are especially useful as vehicles for alcoholic preparations, such as tinctures and fluidextracts, excepting those that are highly resinous. It must be remembered, however, that elixirs are stronger in alcohol than the strongest sherry wine, and that their long continued use in liberal doses may lead to the alcohol habit.

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Only three elixirs are official:

	Composition.	Gm. or Cc.
Elixir aromaticum, Aromatic elixir.	Compound spirit of orange,	1,20
	Syrup,	37,50
	Purified talc.,	3,00
	Alcohol,	25,00
	Distilled water, to	100,00
Elixir adjuvans, Adjuvant elixir.	Fluidextract of glycyrrhiza,	12,00
	Aromatic elixir,	88,00
Elixir ferri, quininae et strychninae phosphatum, Elixir of iron, quinine and strychnine phosphates.	Soluble ferric phosphate,	0,070
	Quinine,	0,035
	Strychnine,	0,001
	Aromatic elixir,	4,000

The first two are intended to serve as elegant vehicles; the last one is a popular medicament. The **dose** of elixirs is generally a teaspoonful (4 Cc.)

Prepare as example:

ELIXIR AROMATICUM—AROMATIC ELIXIR.

Compound spirit of orange,	0,36 Cc.
Syrup,	11,25 Cc.
Purified talc,	0,90 Gm.
Alcohol,	
Distilled water, each, a sufficient quantity to make	30,00 Cc.

To the compound spirit of orange, add enough alcohol to make 7,50 Cc. To this solution add the syrup in several portions, agitating after each addition and afterwards add, in the same manner, 11,25 Cc. of distilled water. Mix the purified talc intimately with the liquid, and then filter through a wetted filter, returning the first portions of the filtrate until a transparent liquid is obtained. Lastly wash the filter with a mixture of 1 volume of alcohol and 3 volumes of distilled water, until the product measures 30,0 Cc. Preserve in a bottle, and label with official name.

Exercise in Prescription-Writing.

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PROBLEM 41. For sick headache. 15 doses of potassium bromide, 0,5 Gm.; aromatic spirit of ammonia, 2 Gm., with enough adjuvant elixir for teaspoonful. Dose to be taken every hour until relieved.

PROBLEM 42. Antiemetic. Ten doses of menthol 0,1 Gm., and chloroform, 0,15 Cc., in dessertspoonful of aromatic elixir, to be taken every hour until relieved.

DIVISION 3.

GLYCERIN SOLUTIONS.

Glycerin lies between alcohol and water in its solvent properties. It is an excellent solvent for tannic, carbolic and boric acids, starch, creosote, tar and many metallic salts. Its taste is not unpleasant; indeed it may be used as a sweetening agent. It resembles syrup not only in this respect, but also in its power of preventing or retarding many chemic reactions. It is much superior to syrup as a preservative for organic substances, as it is endowed with considerable antiseptic action, which makes it, for instance, the best solvent and preservative for such delicate organic bodies as ferments or vaccine.

Being without any decided therapeutic action, it is often preferable to alcohol. The fact that it does not, like water and alcohol, dry up when applied to the skin, makes it a valuable vehicle for external remedies, resembling in this respect, as well as in its emollient (softening) qualities, the fixed oils, without their tendency to rancidity. It is, however, too viscid for most purposes, and should be diluted with at least an equal volume of water.

CLASS 1. GLYCERITA. GLYCERITES.

NOM.—*Glyceritum;* gen., *glyceriti;* gender, neuter.

PRONUNCIATION.—glis-er-i'-tum.

DEFINITION.—**Solutions of medicinal substances in glycerin.**

The advantages of glycerin as a solvent have already been pointed out. The following official glycerites are liquids, and are used mainly for the purpose of affording a simple and rapid method of making solutions of substances not otherwise easily

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soluble; these glycerin solutions being mixable with water and with alcohol without precipitation.

	Composition.	Gm. in Glycerin enough for 100 Cc.	Av. Dose.
Glyceritum acidi tannici, Glycerite of tannic acid.	Tannic acid,	20,00	2,00 Cc.
Glyceritum boroglycerini, Glycerite of boroglycerin.	Boric acid,	31,00	
Glyceritum ferri, quininae et strychninae phosphatum, Glycerite of the phosphates of iron, quinine and strychnine.	Soluble ferric phosphate,	8,00	
	Quinine,	10,40	
	Strychnine,	0,08	1,00 Cc.
	Phosphoric acid,	20,00	
	Water, enough for	50,00	
Glyceritum hydrastis, Glycerite of hydrastis.	Hydrastis,	100,00	
	Water,	50,00	2,00 Cc.
Glyceritum phenolis, Glycerite of phenol.	Liquefied phenol,	20,00	0,30 Cc.

An entirely different purpose is served by the **glycerite of starch** *(glyceritum amyli)*, which is a useful substitute for the fatty ointment bases; having the advantages of greater cleanliness, easy removal from the skin, mixibility with water, and excellent solvent properties; however, medicinal agents are not easily absorbed from it by the skin. Its chief use is as a toilet preparation, and in the treatment of superficial skin diseases.

Prepare:

GLYCERITUM AMYLI—GLYCERITE OF STARCH.

Starch,	2 Gm.
Water,	2 Cc.
Glycerin,	16 Gm.

Triturate the starch with the water until a homogeneous mix-

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Practice in Prescription-Writing.

PROBLEM 43. Astringent application for chilblains, etc. Prescribe 50 Gm. of glycerite of starch, with 20 per cent of tannic acid, to be used locally.

PROBLEM 44. Antiseptic pigment for sore mouth. 30 Cc. of glycerite of boroglycerin. Directions: apply every three hours.

PROBLEM 45. Cough Syrup. Prescribe 12 doses of 0,3 Gm. terpine hydrate dissolved in glycerin, a sufficient quantity for solution. *(Quantum sufficiat ad solutionem)* with enough syrup of tar to make teaspoonful. Dose to be taken every three hours.

SUBORDER B. SUSPENSIONS.

CLASS 1. MISTURAE. MIXTURES.

NOM.—*Mistura;* gen., *misturae;* abbr., *mist.;* gender, female.

PRONUNCIATION.—Mis-tu'-rah.

ORIGIN OF NAME.—From Lat. *miscere,* mix; hence might be applied to any liquid preparation consisting of two or more simple bodies; the United States Pharmacopoeia, however, restricts its meaning as follows:

DEFINITION.—**Aqueous liquid preparations which contain finely divided solid matter in partial suspension.** Hence in the pharmacopoeial sense, a mixture is always a cloudy or muddy liquid. If the substance in suspension be a fat or a resin the preparation is known as emulsion.

Mixtures enable us to administer insoluble substances in fluid form. They have the advantage over powders, divided into separate doses in an appropriate manner, of being less laborious in preparation and therefore less expensive. Mixtures have the disadvantage, however, of a certain degree of inaccuracy of dosage; for even though shaken thoroughly just before taking, a certain amount of separation is liable to take place while the medicine is being poured. It is for this reason that the following two rules must be observed in prescribing mixtures.

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insoluble substances in suspension, so as to increase the viscidity of the liquid, thereby lessening the rapidity of separation and increasing the accuracy of dosage. The mucilages most suitable for this purpose are mucilage of acacia *(mucilago acaciae,)* or mucilage of tragacanth *(mucilago tragacanthae).* Let the viscid constituent form from one-fourth to one-half the bulk of the mixture; the heavier the powder to be suspended and the greater its amount, the higher should be the percentage of the viscid addition.

Most mixtures, on account of the presence of dilute mucilage or syrup, do not keep well; and should therefore be freshly made when wanted. When a mixture is allowed to stand, the insoluble substance separates, hence a "shake" label should always be placed upon the bottle.

The **dose** of mixtures is generally a **teaspoonful to a tablespoonful.**

The following mixtures are official:

	Composition.	Gm. or Cc.	Av. Dose.
Mistura cretae, Chalk mixture.	Compound chalk powder,	20,00	
	Cinnamon water,	40,00	16,00 Cc.
	Water, enough for	100,00	
Mistura ferri composita, Compound iron mixture. (Syn. Griffith's mixture.)	Ferrous sulphate,	0,60	
	Myrrh,	1,80	
	Sugar,	1,80	16,00 Cc.
	Potassium carbonate,	0,80	
	Spirit of lavender,	6,00	
	Rose water, enough for	100,00	
Mistura glycyrrhizae composita, Compound mixture of glycyrrhiza. (Syn. Brown mixture.)	Extract of glycyrrhiza,	3,00	
	Syrup,	5,00	
	Acacia,	3,00	
	Camphorated tincture of opium,	12,00	8,00 Cc.
	Wine of antimony,	6,00	
	Spirit of nitrous ether,	3,00	
	Water, enough for	100,00	
Mistura rhei et sodae, Mixture of rhubarb and soda.	Sodium bicarbonate,	3,50	
	Fluidextract of rhubarb,	1,50	
	Fluidextract of ipecac,	0,30	4,00 Cc.
	Glycerin,	35,00	
	Spirit of peppermint,	3,50	
	Water, enough for	100,00	

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Prepare as example:

MISTURA CRETAE.—CHALK MIXTURE.

Prepared Chalk,	1,8 Gm.
Acacia, in fine powder,	1,2 Gm.
Sugar, in fine powder,	3,0 Gm.
Cinnamon water,	12,0 Cc.
Water, a sufficient quantity to make	30,0 Cc.

Mix the chalk, the acacia, and the sugar by means of mortar and pestle; then add the cinnamon water and 6,0 Cc. of water in portions, triturating after each addition, until a uniform mixture results. Transfer this to a graduate, and rinse the mortar with enough water to make the product measure 30,0 Cc. Mix. Preserve in bottle and label with official name.

Experiment. Put up following prescription:

℞

Acidi hydrochlorici diluti	2,0 Cc.
Misturae cretae	10,0 Cc.

M. S.—"Shake well." Teaspoonful in water every two hours. Why is it incompatible?

Practice in Prescription-Writing.

PROBLEM 46. Injection in gonorrhea. 180 Cc. of mixture containing ½% of zinc sulphate and 1% of lead acetate with a little mucilage of acacia to favor suspension. Though chemically incompatible, this is a useful formula, the finely precipitated lead sulphate exerting beneficial protective influence upon the inflamed membrane.

PROBLEM 47. Antidiarrheal mixture.—16 doses of chalk mixture; two teaspoonfuls to be taken every two hours.

PROBLEM 48. Lotion in acne. Borax, 4,0 Gm.; Precipitated sulphur, 12,0 Gm.; Glycerin, 12,0 Cc.; Rose water, enough for 180,0 Cc.

CLASS 2. EMULSA. EMULSIONS.

NOM.—*Emulsum;* gen., *emulsi;* abbr. *emuls.*, gender, neuter. Other form sometimes used: *Emulsio,* gen. *emulsionis;* gender, female.

PRONUNCIATION.—e-mul'-sum.

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ORIGIN OF NAME fr. Lat. *emulgere*, to milk.

DEFINITION.—**Mixtures of milky appearance, made by suspending oily or resinous substances in aqueous liquids by means of some gummy, viscid substance.**

The object of emulsification is to render certain substances which are insoluble in water freely mixible with this fluid, which makes it easier to disguise the taste of these substances, possibly facilitates their absorption, and permits of admixture of other medicament. In order to accomplish this, the oily substance must be broken up into the finest particles, and each of these coated with gummy substance *(emulsifier)* to keep them from reuniting. Milk, which may be taken as a type of emulsions contains the butter-fat in suspension by the casein.

Examine droplet of milk under the microscope.

The following emulsions are official:

	Composition.	Gm. or Cc.	Av. Dose.
Emulsum amygdalae, Emulsion of almond.	Sweet almond,	6,00	
	Acacia,	1,00	120,00 Cc.
	Sugar,	3,00	
	Water, enough for	100,00	
Emulsum asafœtidae, Emulsion of asafetida.	Asafetida,	4,00	
	Water, enough for	100,00	16,00 Cc.
Emulsum chloroformi, Emulsion of chloroform.	Chloroform,	4,00	
	Expressed oil of almond,	6,00	
	Tragacanth,	1.00	8,00 Cc.
	Water, enough for	100,00	
Emulsum olei morrhuae, Emulsion of cod liver oil.	Cod liver oil,	50,00	
	Acacia,	12,50	
	Syrup,	10,00	8,00 Cc.
	Oil of gaultheria,	0,4	
	Water, enough for	100,00	
Emulsum olei morrhuae cum hypophosphitibus, Emulsion of cod liver oil with hypophosphites.	Contains in addition of ingredients of plain cod liver oil emulsion:		
	Calcium hypophosphite,	1,00	
	Potassium hypophosphite,	0,50	8,00 Cc.
	Sodium hypophosphite,	0,50	
Emulsum olei terebinthinae, Emulsion of oil of tur-	Rectified oil of turpentine	15.00	

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We find among these official emulsions examples of the two types of emulsions, namely: Group 1. Gum-resin and seed emulsions, Group 2. Artificial emulsions.

GROUP 1. **Gum-resin and seed emulsions.** There are some substances that contain their own emulsifier; namely, gum-resins and certain seeds. When triturated with water, these yield emulsions because they contain an oily and a gummy substance in intimate mixture, and all that is needed is to add water to dissolve the gummy substance, which then readily envelops and keeps separate the globules of oil or resin. Emulsion of almond and emulsion of asafetida are examples of such emulsions.

Prepare as example:

EMULSUM ASAFOETIDAE. EMULSION OF ASAFETIDA.

Asafetida,	1,2 Gm.
Water, a sufficient quantity, to make	30,0 Cc.

Rub the asafetida in a mortar, with 27 Cc. of water, at first very gradually added, until a uniform emulsion results. Then strain the mixture into a graduated vessel, and rinse the mortar and strainer with enough water to make the product measure 30 Cc. Mix the whole thoroughly. Preserve in a bottle, and label with official name.

GROUP 2. **Artificial Emulsions.** If we desire to produce an emulsion of an oil unassociated with an emulsifier, we may do so by simply shaking or triturating the oil with a mucilaginous liquid, such as mucilage of acacia or extract of malt. A better method, however, consists in reproducing the condition present in gum-resins or in seeds, namely in first securing an intimate admixture of the oil and the gum and then adding the water with active trituration; the oil being dashed into globules at the same time as the water dissolves out the gum. In order to be successful with this method, it is necessary to have a sufficient quantity of gum mixed with the oil; the most generally useful proportion being 1 part of gum to 4 parts of fixed oil (or two parts of volatile oil). It is likewise necessary to add enough water to dissolve the gum at once; avoiding, however, an excess of water, which would thin the mucilage, rendering it less efficient as an enveloping agency; a suitable proportion is 2 parts of

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water for 1 part of gum. Certain precautions must furthermore be observed, which can best be studied by a practical example.

Prepare by carefully following the instructions in every detail:

EMULSUM OLEI MORRHUAE. EMULSION OF COD LIVER OIL.

Cod Liver Oil,	15,00	Cc.
Acacia, in fine powder,	3,75	Gm.
Syrup,	3,00	Cc.
Oil of gaultheria	0,12	Cc.
Water, a sufficient quantity, to make	30,00	Cc.

Rub the acacia with the cod liver oil in a *dry* mortar until uniformly mixed; then add at once, before the acacia has had time to separate, 7,5 Cc. of water (which must be measured in a clean, not oily graduate), pouring it into the center of the mortar after having lifted the pestle. Immediately triturate lightly and rapidly until the mixture becomes white, creamy, and makes a crackling noise on stirring. In triturating rapid motion is essential, but no pressure is needed. This forms the primary emulsion; to it add the oil of gaultheria and the syrup, with enough water to make the product measure 30,0 Cc., and mix thoroughly. Preserve in bottle, and label with official name.

Examine droplet of emulsion under microscope, and compare with milk.

In **prescribing emulsions**, it must be borne in mind that the three essential ingredients in all emulsions are: 1. Oil or resin. 2. Emulsifying agent. 3. Water.

Emulsions may be made to contain 50% of fixed oil. Volatile oils are not emulsified as readily; their emulsification is greatly facilitated by first dissolving them in two to three times their volume of fixed oil, the solution being then emulsified; this is called emulsification by intervention. The official emulsion of chloroform and the emulsion of turpentine are examples of emulsions prepared by intervention.

The emulsifying agent par excellence is acacia. As previously stated, it should be present in the proportion of one to four of fixed oil, or one to two of volatile oil. Whenever a physician is in doubt as to the quantity of emulsifying agent needed, he may simply prescribe "q. s." of the emulsifyer. **Resinous tinctures**

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may be emulsified, and thus a perfect mixture be obtained with water, by adding twice the volume of mucilage of acacia; the latter to be diluted with water as much as possible before adding the tincture, in order to prevent precipitation of the gum by the alcohol. Other emulsifying agents are extract of malt, yolk of egg, condensed milk; they have, however, no advantage over acacia. Saponin is an efficient emulsifyer; but it has an acrid taste and irritating qualities which render it objectionable. Soaps and alkalies apparently facilitate emulsification; they form soaps, however, and not true emulsions.

Owing to difference in specific gravity, even good emulsions tend to separate, on standing, into layers; just as the cream rises to the top of the milk. The oil does not separate, however; and a little shaking should quickly reincorporate the separated layer. Overagitation may cause the oil to separate; as butter is made from milk by long continued agitation.

Incompatibilities. Salts, sugar, glycerin, if added in considerable quantity, increase the tendency to separation; hence only small quantities of these substances are permissible. Sweetening of emulsions is best done by means of saccharin. Acids and acid salts antagonize emulsification; while alkalies and alkaline salts assist. Substances that are incompatible with gum, such as alcohol or ferric chloride, are incompatible with gum emulsions; thus tinctures can only be added in very small quantities to such emulsions.

The **dose** of emulsions ranges from a teaspoonful to a tablespoonful. As they are not digested in the stomach, they are best administered about two hours after meals; so as to be introduced into the intestine as promptly as possible.

Practice in Prescription-Writing.

PROBLEM 49. Laxative antidiarrhoeal mixture. Prescribe 8 doses of 40% Castor oil emulsion, flavored with peppermint water, sweetened with saccharin, and rendered more agreeable in its operation by the addition of tincture of opium 0.25 Cc. to each dose. Directions: A tablespoonful every hour till it operates.

PROBLEM 50. Expectorant emulsion. Order 15 doses of terebene 0,5 Cc. emulsified with acacia by intervention of expressed

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oil of almond, flavor with a little syrup of tar. Directions: Teaspoonful three times a day after meals.

PROBLEM 51. 30 doses of cod liver oil emulsion. Tablespoonful to be taken three times daily two hours after meals.

ORDER II. EXTRACTIVE PREPARATIONS.

Divided into:

Suborder A. Liquids.
Suborder B. Solids.

Suborder A. **Liquid Extractive Preparations are divided,** according to the menstruum used, into:

DIVISION 1. Aqueous Liquids, including:
Class 1. Infusions.
Class 2. Decoctions.

DIVISION 2. Alcoholic Liquids, including:
Class 1. Tinctures.
Class 2. Wines.
Class 3. Fluidextracts.

DIVISION 3. Acetous Liquids.
Class 1. Vinegars.

DIVISION 4. Oily Liquids.
Class 1. Oleoresins.

Suborder B. **Solid Extractive Preparations** divided into:
Class 1. Extracts.
Class 2. Resins.

PREPARATION OF VEGETABLE DRUGS FOR USE AS MEDICINES.

Before a vegetable drug can be administered to our patients in elegant form as a medicine, it has to pass through a consider-

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1. **Collecting** of the drug is an important step which needs careful and intelligent supervision. Even the gathering of the proper plant is not always an easy matter, as there are closely related species and varieties of plants, one of which may be entirely worthless, the other highly active. Experience has also shown that the medicinal activity of plants varies greatly during their vegetative period, so that the proper time of collection is of importance. Furthermore, although the entire plant may contain an active principle, a certain tissue of that plant contains more of it than any other part, hence it is this plant portion that is collected and prepared for the drug market. In case of the official drugs the pharmacopœia gives on all these points precise directions, which are the result of a great deal of experience and investigation.

2. **Desiccation,** (drying, or curing). Only a few vegetable drugs are used in the fresh state. The amount of moisture present is generally great, often as much as 75 per cent., and varies greatly even in the same plant organs depending upon age and freshness, the soil and the season. This is the reason why such preparations as tinctures of fresh herbs (*Tincturae herbarum recentium* U. S. P., 50 per cent.) are less uniform in strength than those made from the dried drug. The necessity of drying becomes furthermore apparent when we recognize the fact that most drugs are grown great distances from manufacturer and consumer, and that the presence of moisture in dead tissue favors rapid chemical disintegration, micro-organisms developing within a very short time and destroying the drug. It is therefore desirable to remove this moisture as rapidly and completely as possible. This drying must be done very carefully, for almost all vegetable principles are injured by heat; indeed, no matter how carefully the drying be done, there is nearly always a loss of active constituents. But this loss is insignificant as compared with the loss which would follow if any considerable degree of moisture were present. Besides the drying, the proper method of preservation is of great importance. However, in spite of greatest care in drying and preservation, drugs lose their medicinal virtues in a comparatively short time. Nearly all drugs become worthless within two or three years, and some much sooner. Another advantage of drying is that it causes all tissues to become more brittle, which facilitates the next step.

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3. **Comminution** or powdering of the drug. This is done for the purpose of ready extraction of active constituents. In order to have a certain uniform degree of fineness, powders are sifted, and are classified according to the size of the meshes in the sieve through which they pass, from No. 80 (80 meshes to the linear inch), which is very fine, down to No. 20, which is coarse. Powdered drugs deteriorate very rapidly. It is very difficult to obtain reliable powdered drugs in the market.

4. **Extraction** is the process of separating the desired principles from drugs by the action of a solvent in which these principles are soluble. This solvent is called the menstruum. Extraction is, however, not the only process by which valuable ingredients are separated from the inert materials of drugs. Thus pressure is applied wherever a liquid constituent present in considerable quantity is to be separated from solids; as in the separation of fixed oils from seeds. Distillation, or sublimation is resorted to, if volatile constituents are to be separated from non-volatile matter, as in the preparation of most volatile oils. Pressure and distillation are processes that require elaborate apparatus in order to carry them on profitably; they are therefore not practiced by pharmacists but by manufacturing chemists; and for this reason the results of these processes are not considered pharmaceutic preparations. Extraction, on the other hand, does not require elaborate apparatus; and is distinctly a pharmaceutic process; though even here machinery and wholesale production can be applied to such advantage that pharmacists buy manufactured preparations more and more extensively. Still it is necessary for the student to be familiar with the principles and practice of extraction, as without such knowledge the extractive preparations cannot be understood.

Extraction, being a process of solution, is favored by the same factors as solution, namely time, subdivision, agitation, and heat. The success of the process depends mainly upon the proper choice of the menstruum and of the method of extraction.

The choice of the menstruum must be determined by the solubility of the desirable constituents. The importance of the proper choice will be appreciated by a study of the following table of solubilities of the various proximate principles of plants.

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Mostly soluble in water; but insoluble in alcohol and similar solvents:

Carbohydrates.
Some glucosides, e. g. saponins.
Proteids.
Ferments.

Mostly soluble in water and in alcohol; but insoluble in ether and similar solvents:

Alkaloidal salts.
Some glucosides.
Bitter, and neutral principles.
Tannins.
Organic acids.
Coloring matter.

Soluble in alcohol; but insoluble in water:

Resins.
Volatile oils.
Oleoresins.
Balsams.
Some glucosides.

Soluble in ether and similar solvents; but insoluble in water and in alcohol:

Fixed oils.
Waxes.

It must be recognized that there are exceptions to the general propositions laid down in above table.

The menstruum selected in the official formulae is generally the best available in the present state of our knowledge. Often dilute alcohol is used, which to a certain extent combines the advantages of both alcohol and water.

Of the methods of extraction the two most important are: (a) Maceration. (b) Percolation.

(a) **Maceration** consists of simply soaking the drug in the menstruum for a certain length of time; within limits, the longer the better; and separating the insoluble residue by straining, pressure, and filtering. The higher the temperature the quicker the solution; hence wherever possible heat is used. Different names are given to the process according to the temperature at which it is carried out. Maceration proper is done at about 15-20° C. (59—68° F.) **Digestion** is maceration plus gentle heat

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32—38° C. (90—100° F.) **Decoction** is maceration plus boiling. **Infusion** is pouring on of hot water upon the drug, and then macerating.

(b) **Percolation,** as defined by the pharmacopoeia, consists in subjecting a substance or a mixture of substances, in powder, contained in a vessel called a percolator, to the solvent action of successive portions of a certain menstruum in such a manner that the liquid, as it traverses the powder in its descent to the receiver, shall be charged with the soluble portion of it, and pass from the percolator free from insoluble matter.

The percolator is a tall, nearly cylindrical, or slightly conical vessel, with a funnel-shaped termination at the smaller end. Into the lower opening of the percolator is gently pressed a small tuft of cotton, which filters the liquid ere it escapes from the apparatus. The properly moistened powder is then packed into the percolator, of which it should not occupy more than two-thirds the height. The menstruum is then poured on. It permeates the powder slowly and evenly; and finally drops from the lower orifice nearly saturated with the soluble constituents of the substance treated. The first portions of the menstruum are continually replaced by new portions of the solvent, which in their passage through the substance do not mingle materially with the first portion but simply displace it, hence this process is also called *displacement.* Thus each successive portion of menstruum finds less and less soluble substance, and eventually none; so that in a successful percolation, the liquid that has passed through, which is known as percolate, becomes progressively weaker, and weaker, and ultimately the menstruum passes through free from desirable principles. The drug is then considered exhausted.

It will be noted that the main advantage of percolation over maceration consists in the fact that the fluid retained in the residue in case of maceration is charged with desirable principles, while in case of percolation it is merely menstruum. This makes it possible to extract a large quantity of substance with a comparatively small quantity of menstruum, to produce very concentrated preparations, such as the fluidextracts. When, on the other hand, the quantity of menstruum is large as compared with the amount of drug, maceration will serve the purpose. Often maceration and percolation are combined advantageously.

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The details of these processes can best be studied practically, which will be done in succeeding pages.

5. **Standardization** of preparations. The chances for unreliability of pharmaceutic preparations are exceedingly numerous. In the collection, the drying, the preservation and the extraction there is everywhere danger of variability in strength, and of impairment, or even complete loss of activity. Actual examination of specimens of the same preparation of an important drug from various reliable drug stores has shown startling variability; some being stronger, others a great deal weaker, than the official standard; and yet probably all were made after the letter of the pharmacopœia. This is an alarming state of affairs, for "a poor drug to the physician is far more dangerous than a blunt knife to the surgeon, as the latter can immediately detect the inefficiency of his instrument and handle it accordingly, while the former, failing to obtain the desired action, may have lost his opportunity and his patient's life."

For many years this was unavoidable; but at present the case is different. We now know that most vegetable drugs do not act as a whole, but that their activity is due to certain ones of their constituents called "active principles," and we have learned how to isolate many of these.

The most radical way out of the difficulty would be to use the isolated active principles; and untiring efforts have made many of them available for practical use as medicines; these efforts have failed, however, in case of a few most important remedies. Wherever available, the active principles have a great deal to recommend them. Their dose is generally small, so that they may be used hypodermically; if administered by mouth, their taste is easily disguised; they are unvarying in strength and activity and prompt in action, being more rapidly absorbed than preparations of the crude drug. This rapidity of absorption, however, lessens local action; and when maximum local with minimum general action is desired, the preparations of the crude drug ought to be preferred. It should, furthermore, be remembered that many of the isolated principles do not represent the whole activity of the drug as fairly as a good preparation of the crude drug, because there are often other though less active principles present in the latter. For these reasons, and because there are some drugs whose active principles are not suf-

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ficiently well known or are too difficult to isolate, we still have to make use frequently of the comparatively crude extractive preparations.

Whenever we use such preparation, we should insist upon standardization in case of all the more active remedies. Two methods are available for this purpose: (a) Assaying and (b) the pharmacologic test.

(a) **Pharmaceutic assaying** involves the separation of the active principles in a certain quantity of a drug or preparation, to determine the percentage present; and then to concentrate or dilute the remainder of the substance tested to bring it to a standard percentage. In the present pharmacopœia the preparations of nearly all the important drugs are directed to be assayed. It is only when the assay process is very difficult or unreliable that it has been omitted. (See assay of tincture of opium.)

(b) **Pharmacologic testing**, though it has not been introduced in the pharmacopœia, should be used in all cases where assaying is unreliable or impossible, as is the case especially with drugs whose active principle is a glucoside, such as digitalis and ergot. The determination of the toxic dose per gram of animal would be a simple and quite accurate test, and should be used whereever chemical assay is impracticable. (See Pharmacologic assay of infusion of digitalis).

It is to be hoped that in the near future physicians will use none but standardized preparations of drugs.

Division 1. Aqueous Extractive Liquid Preparations.

CLASS 1. INFUSA,—INFUSIONS.

(Teas.)

Nom. —*Infusum;* gen., *infusi;* abbr., *infus.;* gender, neuter.

Pronunciation.—Lat. in-fu'-sum.

Origin of Name.—*Infusum* is the participle of the Lat. verb *infundere,* to drench, pour on.

Definition.—**Aqueous solutions of the soluble principles of vegetable drugs, obtained by treating the drug with hot or cold water.** No boiling is used in their preparation.

The following infusions are official:

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	Composition.	Gm. or Cc. in 100 Cc.	Av. Dose.
Infusum digitalis, Infusion of digitalis.	Digitalis,	1,50	
	Alcohol,	10,00	
	Cinnamon water,	15,00	8,00 Cc.
Infusum pruni virginianae, Infusion of wild cherry.	Wild cherry,	4,00	
	Glycerin,	5,00	60,00 Cc.
Infusum sennae compositum, Compound infusion of senna. (Syn. Black draught.)	Senna,	6,00	
	Manna,	12,00	
	Magnesium sulphate,	12,00	
	Fennel,	2,00	120,00 Cc.

The pharmacopœia also contains a general formula for infusions according to which the preparation would represent 5% of any drug desired. The strength of infusions of energetic or powerful substances should, however, be especially prescribed by the physician.

Prepare as example:

INFUSUM DIGITALIS, INFUSION OF DIGITALIS.

Digitalis, bruised,	0,45	Gm.
Alcohol,	3,0	Cc.
Cinnamon water,	4,5	Cc.
Boiling water,	15,0	Cc.
Cold water, a sufficient quantity to make,	30,0	Cc.

Upon the digitalis, contained in an evaporating dish, pour the boiling water, cover the dish, and allow contents to macerate for one hour. Then strain, add the alcohol and cinnamon water to the strained liquid, and pass enough cold water through the residue on the strainer to make the product measure 30 Cc. Preserve in bottle and label with official name.

Pharmacologic assay of infusion of digitalis.* As digitalis preparation vary considerably in strength, and standardization by chemical assay is impossible, a pharmacologic estimation of the activity of its preparations has been proposed, which is as follows:

Select 3 frogs of about the same size, weigh them, and mark them by loosely tying string to the toes, so as to be able to identify them. Inject 2 Cc. of the infusion into the anterior

* Edmunds and Cushny, Laboratory Guide in Experimental Pharmacology.

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lymph sac of one of the frogs in the following manner. Fill a hypodermic syringe with the carefully measured liquid; and holding the animal with its back downward in the palm of the hand, force the mouth open with the needle of the syringe. Pass the needle through the floor of the mouth, so that its point can be seen beneath the skin of the abdomen; it will have entered the lymph sac. Now inject the liquid.

Inject in the same manner 1,5 Cc. into frog No. 2; and 1 Cc. into the third frog.

Record the time when each injection was made. Keep the frogs under a bell jar; and examine the condition of each frog's heart at the end of 1 hour after injection. This is done by carefully cutting away the tissues overlying the heart. Before exposing the heart, the brain should be destroyed, if the frog is still alive. To destroy the brain, hold the frog with its back upward, make a cut through the skin at the junction of the skull and spinal column; and push the sharpened end of a match through the foramen magnum into the cranial cavity, rotating the match to destroy the tissue within.

In this manner we aim to determine the dose of the preparation that is just sufficient to kill a standard frog of 20 Gm. weight in one hour, at which time the heart should have just ceased beating with the ventricle in contraction and the auricles markedly distended with blood. Should all three hearts be found still beating, the doses were too small and will have to be increased in fresh frogs of corresponding weight. Should, on the other hand, the frogs have been dead for some time, the doses were too large and smaller doses will have to be tried in other frogs. Should the weight of the frogs differ from the standard weight, a simple calculation will determine the fatal dose for the standard frog.

If a tincture or other alcoholic preparation is to be tested in this manner, it should first be evaporated over the water bath to about half volume, in order to drive off alcohol, and then made up to the original volume by the addition of 0,7% salt solution.

CLASS 2. DECOCTA,—DECOCTIONS.

NOM.—*Decoctum;* gen., *decocti;* abbr., *decoct.*, gender, neuter.
PRONUNCIATION.—de-kok'-tum.

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ORIGIN OF NAME.—Decoctum is the participle of the Lat. verb *decoquere*, to boil down.

DEFINITION—**Liquid preparations made by boiling vegetable substances for some time in water and then straining.**

The pharmacopœia contains the following general formula for

DECOCTA. Decoctions.

Take of	
The substance, coarsely comminuted,	5 Gm.
Water, a sufficient quantity, to make	100 Cc.

Introduce the substance into a suitable vessel provided with a cover, pour upon it 100 Cc. of cold water, cover it well, and boil for 15 minutes. Then allow it to cool to about 40°C. (104°F), express, strain the expressed liquid, and pass enough cold water through the strainer to make the product measure 100 Cc.

Caution.—The strength of decoctions of energetic or powerful substances should be specially prescribed by the physician.

Prepare for example, according to above directions:

℞

Decocti scoparii,	120,0 Cc.

Sig. Two tablespoonfuls every two hours.

General Remarks on Infusions and Decoctions.

Infusions and decoctions are useful when it is wished to extract from a drug some principle that is more soluble in water than in alcohol; or when the therapeutic effect of alcohol, or incompatibilities of alcohol are to be avoided. Leaves, soft parts of plants, or substances containing volatile principles, may be made into infusions. Hard parts of plants, roots, rhizomes, woods, barks, etc., are made into decoctions rather than infusions, if their active principles are not destroyed by the heating.

There are, however, many disadvantages connected with the use of infusions and decoctions. Unless they contain antiseptic, they are very prone to spoiling. They should therefore be freshly prepared; which, however, is rather troublesome. They are, furthermore, comparatively feeble preparations, generally taken in doses of 30 Cc. or more, except infusion of digitalis, the dose of which is 8 Cc. The refinement of modern pharmacy, having in almost every instance furnished us with more elegant

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preparations than these bulky and bad tasting teas, have caused them to be almost entirely discarded.

Practice in Prescription-Writing.

PROBLEM 52. Diuretic in cardiac dropsy. Prescribe a suitable number of tablespoonful doses of infusion of digitalis with 1,0 Gm. of potassium citrate. Dose to be taken three times a day after meals.

PROBLEM 53. Diuretic. Prescribe of 5% decoction of scoparius enough to last two days. Wineglassful to be taken every four hours.

PROBLEM 54. Quinine enema; to obviate bitter taste. Prescribe 2,0 Gm. of quinine sulphate, with 0,5 Cc. of tincture of opium and 120,0 Cc. of decoction of althaea; the last two ingredients being added to favor retention of the enema.

DIVISION 2.

ALCOHOLIC EXTRACTIVE LIQUID PREPARATIONS.

These are the most important liquid preparations made from vegetable drugs; for the reason that alcohol offers peculiar advantages as a menstruum combining preservative powers with highly desirable solvent properties. It not only dissolves many medicinally valuable principles that water will not dissolve, but also refuses to dissolve many undesirable constituents of vegetable drugs, such as gums, proteids, which water does extract. In many cases dilute alcohol is used, which combines the solvent properties of alcohol and of water. The difference between the various groups of alcoholic preparations is mainly one of strength. They will be considered in the following order. (1.) Tinctures. (2). Wines. (3). Fluidextracts.

CLASS 1. TINCTURAE. TINCTURES.

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DEFINITION.—**Tinctures are rather dilute alcoholic or hydro-alcoholic solutions containing non-volatile substances.**

They are the best liquid preparations of highly active or poisonous drugs; since the quantity of solvent is sufficiently large to insure complete exhaustion of the drug and to keep the principles in solution. On the other hand, in case of drugs of slight activity the dose of the tincture may become so large that the action of the alcohol contained in it overshadows the action of the drug. In such cases, the more concentrated alcoholic preparations known as fluidextracts (q. v.) are to be preferred.

In accordance with the recommendations of the "International Conference for the Unification of Formulae for Heroic Medicines" the strength of potent tinctures has been made 10 per cent; and that of other tinctures 20 per cent. The **dose** of potent tinctures ranges between 0, 5 and 1,0 Cc. The other tinctures, mostly 20 per cent, may be divided according to their average dose into less potent tinctures, average dose ranging between 1 and 2 Cc.; and feeble tinctures, whose average dose ranges between 2 and 4 Cc.

The official tinctures will, therefore, be divided into three groups:

GROUP 1. **Potent tinctures**; generally representing **10%** of drug, average dose ranging between **0,5 and 1 Cc.**

GROUP 2. **Less potent tinctures,** generally representing **20%**, average dose ranging between **1 and 2 Cc.**

GROUP 3. **Feeble tinctures**; generally representing **20%** of drug, average dose ranging between **2 and 4 Cc.**

GROUP 1. POTENT TINCTURES.

	Composition, Gm. or Cc. in 100 Cc.		Menstruum	Av. alcoholic strength.	Dose
Tinctura aconiti, Tincture of aconite.	Aconite, Assayed to contain aconitine	10,00 0,045	70,00		0,60 Cc.
Tinctura belladonnae foliorum, Tincture of belladonna leaves.	Belladonna leaves, Assayed to contain mydriatic alkaloids,	10,00 0,035	50,00		0,50 Cc.

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Tinctura cannabis indicae, Tincture of Indian cannabis	Indian cannabis	10,00	100,00	0,60 Cc.
Tinctura cantharidis, Tincture of cantharides.	Cantharides,	10,00	100,00	0,30 Cc.
Tinctura capsici, Tincture of capsicum.	Capsicum,	10,00	95,00	0,50 Cc.
Tinctura colchici seminis, Tincture of colchicum seed.	Colchicum seed	10,00	60,00	2,00 Cc.
	Assayed to contain colchicine	0,05		
Tinctura digitalis, Tincture of digitalis.	Digitalis	10,00	50,00	1,00 Cc.
Tinctura ferri chloridi, Tincture of ferric chloride.	Sol. ferric chloride,	35,00	100,00	0,50 Cc.
Tinctura gelsemii, Tincture of gelsemium.	Gelsemium,	10,00	65,00	0,50 Cc.
Tinctura hyoscyami, Tincture of hyoscyamus.	Hyoscyamus,	10,00	50,00	1,00 Cc.
	Assayed to contain mydriatic alkaloids,	0,007		
Tinctura iodi,	Iodine,	7,00		
Tincture of iodine.	Potassium iodide,	5,00	100,00	0,10 Cc.
Tinctura ipecacuanhae et opii,	Deodorized opium,	10,00		
Tincture of ipecac and opium.	Fluidextract ipecac,	10,00	50,00	0,50 Cc.
Tinctura lobeliae, Tincture of lobelia.	Lobelia,	10,00	50,00	1,00 Cc.
Tinctura nucis vomicae, Tincture of nux vomica.	Nux vomica,	10,00	75,00	0,60 Cc.
	Assayed to contain Strychnine,	0,10		
Tinctura opii (Syn. laudanum), Tincture of opium.	Granulated opium,	10,00	50,00	0,50 Cc.
	Assayed to contain Morphine,	1,2-1,25		
Tinctura opii deodorati, Tincture of deodorized opium.	Deodorized opium,	10,00	20,00	0,50 Cc.
	Assayed to contain Morphine,	1,2-1,25		
Tinctura physostigmatis, Tincture of physostigma.	Physostigma,	10,00	100,00	1,00 Cc.
	Assayed to contain ether-soluble alkaloids,	0,014		
Tinctura sanguinariae, Tincture of sanguinaria.	Sanguinaria,	10,00	60,00	
	Acetic acid.		2,00	1,00 Cc.
Tinctura scillae, Tincture of squill.	Squill,	10,00	75,00	1,00 Cc.
Tinctura stramonii, Tincture of stramonium.	Stramonium,	10,00	50,00	0,50 Cc.
	Assayed to contain mydriatic alkaloids,	0,03		

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Tinctura strophanthi, Tincture of strophanthus.	Strophanthus,	10,00	65,00	0,50 Cc.
Tinctura veratri, Tincture of veratrum.	Veratrum,	10,00	100,00	1,00 Cc.

GROUP 2. LESS POTENT TINCTURES.

	Composition, Gm. or Cc. in 100 Cc.		Menstruum alcoholic strength.	Av. Dose
Tinctura aloes, Tincture of aloes.	Purified aloes,	10,00		
	Glycyrrhiza,	20,00	50,00	2,00 Cc.
Tinctura aloes et myrrhae, Tincture of aloes and myrrh.	Purified aloes,	10,00		
	Myrrh,	10,00		
	Glycyrrhiza,	10,00	75,00	2,00 Cc.
Tinctura arnicae, Tincture of arnica.	Arnica,	20,00	50,00	1,00 Cc.
Tinctura asafœtidae, Tincture of asafetida.	Asafetida,	20,00	100,00	1,00 Cc.
Tinctura benzoini, Tincture of benzoin.	Benzoin,	20,00	100,00	1,00 Cc.
Tinctura benzoini composita, Compound tincture of benzoin.	Benzoin,	10,00		
	Purified aloes,	2,00		
	Storax,	8,00		
	Balsam of tolu,	4,00	100,00	2,00 Cc.
Tinctura cinnamomi, Tincture of cinnamon.	Saigon cinnamon,	20,00	67,50	
	Glycerin,		7,50	2,00 Cc.
Tinctura lactucarii, Tincture of lactucarium.	Lactucarium,	50,00	50,00	
	Glycerin,		25,00	2,00 Cc.
Tinctura lavandulae composita, Compound tincture of lavender.	Oil lavender flower,	0,80		
	Oil rosemary,	0,20		
	Saigon cinnamon,	2,00		
	Cloves,	0,50		
	Nutmeg,	1,00		
	Red sounders,	1,00	75,00	2,00 Cc.
Tinctura myrrhae, Tincture of myrrh.	Myrrh,	20,00	100,00	1,00 Cc.
Tinctura pyrethri, Tincture of pyrethrum.	Pyrethrum,	20,00	100,00	
Tinctura quillajae, Tincture of quillaja.	Quillaja,	20,00	35,00	
Tinctura tolutana, Tincture of tolu.	Balsam of tolu,	20,00	100,00	2,00 Cc.
Tinctura zingiberis, Tincture of ginger.	Ginger,	20,00	100,00	2,00 Cc.

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GROUP 3. FEEBLE TINCTURES.

	Composition, Gm. or Cc. in 100 Cc.		Menstruum, alcoholic strength.	Av. Dose.
Tinctura aurantii amari, Tincture of bitter orange peel.	Bitter orange peel,	20,00	60,00	4,00 Cc.
Tinctura aurantii dulcis, Tincture of sweet orange peel.	Sweet orange peel,	50,00	100,00	4,00 Cc.
Tinctura calendulae, Tincture of calendula.	Calendula,	20,00	100,00	
Tinctura calumbae, Tincture of calumba.	Calumba,	20,00	60,00	4,00 Cc.
Tinctura cardamomi, Tincture of cardamom.	Cardamom,	20,00	50,00	4,00 Cc.
Tinctura cardamomi composita, Compound tincture of cardamom.	Cardamom,	2,50		
	Saigon cinnamon,	2,50		
	Caraway,	1,20		
	Cochineal,	0,50	50,00	
	Glycerin,		5,00	4,00 Cc.
Tinctura cimicifugae, Tincture of cimicifuga.	Cimicifuga,	20,00	100,00	4,00 Cc.
Tinctura cinchonae, Tincture of cinchona.	Cinchona,	20,00	67,50	
	Glycerin,		7,50	
	Assayed to contain ether sol. alkaloids	0,75		4,00 Cc.
Tinctura cinchonae composita, Compound tincture of cinchona.	Red cinchona,	10,00		
	Bitter orange peel,	8,00		
	Serpentaria,	2,00	67,50	
	Glycerin,		7,50	4,00 Cc.
Tinctura gallae, Tincture of nutgall.	Nutgall,	20,00	100,00	
	Glycerin,		10,00	4,00 Cc.
Tinctura gambir composita, Compound tincture of gambir.	Gambir,	5,00		
	Saigon cinnamon,	2,50	50,00	4,00 Cc.
Tinctura gentianae composita, Compound tincture of gentian.	Gentian,	10,00		
	Bitter orange peel,	4,00		
	Cardamom,	1,00	60,00	4,00 Cc.
Tinctura guaiaci, Tincture of guaiac.	Guaiac,	20,00	100,00	4,00 Cc.
Tinctura guaiaci ammoniata, Ammoniated tincture of guaiac.	Guaiac,	20,00		
	Aromatic spirit of ammonia		70,00	4,00 Cc.
Tinctura hydrastis, Tincture of hydrastis.	Hydrastis,	20,00	65,00	4,00 Cc.
	Assayed to contain Hydrastine,	0,40		

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Tinctura kino, Tincture of kino.	Kino,	5,00	65,00	
	Glycerin		15,00	4,00 Cc.
Tinctura krameriae, Tincture of krameria.	Krameria,	20,00	50,00	4,00 Cc.
Tinctura limonis corticis, Tincture of lemon peel.	Fresh lemon peel	50,00	100,00	
Tinctura moschi, Tincture of musk.	Musk,	5,00	50,00	4,00 Cc.
Tinctura opii camphorata, Camphorated tincture of opium (Syn. Paregoric).	Powdered opium	0,40		
	Benzoic acid,	0,40		
	Camphor,	0,40		
	Oil of anise,	0,40	50,00	
	Glycerin,		4,00	8,00 Cc.
Tinctura quassiae, Tincture of quassia.	Quassia,	20,00	35,00	2,00 Cc.
Tinctura Rhei, Tincture of rhubarb.	Rhubarb,	20,00		
	Cardamom	4,00	50,00	
	Glycerin,		10,00	4,00 Cc.
Tinctura rhei aromatica, Aromatic tincture of rhubarb.	Rhubarb,	20,00		
	Saigon cinnamon,	4,00		
	Cloves,	4,00		
	Nutmeg,	2,00	50,00	
	Glycerin,		10,00	2,00 Cc.
Tinctura serpentariae, Tincture of serpentaria.	Serpentaria,	20,00	65,00	4,00 Cc.
Tinctura valerianae, Tincture of valerian.	Valerian,	20,00	75,00	4,00 Cc.
Tinctura valerianae ammoniata, Ammoniated tincture of valerian.	Valerian,	20,00		2,00 Cc.
	Aromatic spirit of ammonia,		70,00	2,00 Cc.
Tinctura vanillae, Tincture of vanilla.	Vanilla,	10,00		
	Sugar,	20,00	65,00	

In addition to above, the pharmacopœia contains a general formula for tinctures of fresh herbs,

Tincturae herbarum recentium, Tinctures of fresh herbs.	Fresh herb	50,00
	Alcohol, to make	100,00

Preparation. The tinctures are prepared by percolation, with exception of those drugs to which percolation cannot be applied to advantage, such as aloes, asafetida, tolu, etc.; these are prepared by maceration.

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Prepare as example:

TINCTURA GENTIANAE COMPOSITA. Compound Tincture of Gentian.

Gentian, in moderately coarse powder,	3,0 Gm.
Bitter orange peel, coarse powder,	1,2
Cardamom, coarse powder,	0,3
Menstruum, composed of alcohol, 6 parts water, 4 parts, enough to make	30,0 Cc.

Mix the powders, and moisten them with 1,8 Cc. of the menstruum, stirring thoroughly with spatula, or other suitable instrument, until uniformly moistened. Allow the powder to macerate in a well covered container for 15 minutes or longer. (U. S. P. directions are 12 hours.) This preliminary moistening and maceration is partly for the purpose of giving the menstruum time to dissolve the soluble constituents; but mainly to permit the drug to swell; for if the swelling took place after the drug was firmly packed in the percolator, the drug would become so impacted that the menstruum could not penetrate through it. Even bursting of the percolator might occur.

Prepare a small percolator* as follows: Close the lower orifice with a perforated cork. Pass a small, snugly-fitting glass tube through the perforation in the cork, so that the inner end of the tube is flush with the top of the cork. To the outer end of the glass tube fit a piece of rubber tube, at least one-fourth longer than the percolator, and ending in another short glass tube, whereby the end of the rubber tube may be suspended in a receiving vessel, and raised or lowered until the percolate escapes at the desired rate. Loosely press a small tuft of cotton into the neck of the percolator, and moisten the cotton by pouring a few drops of the menstruum upon it.

Now put in the previously macerated drug, shake it down lightly, and pack it uniformly with a plunger. A cork of about half the diameter of the percolator, and a glass rod which is a little longer than the depth of the percolator fitted into the cork will provide a suitable plunger. Do not use much force in packing the drug, or else the menstruum will have difficulty in penetrating. When the drug is in place, cover the surface of the

* If a suitable percolator cannot be obtained, a funnel may have to serve instead.

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powder with a piece of filter paper cut to fit, and weight it down with a clean pebble or a small glass stopper. Pour on enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the rubber tube, raise the tube to a level that will prevent any outflow; and keep it there, most conveniently by means of a rubber band. Cover the percolator with a small glass plate, and allow the drug to macerate for 15 minutes, (U. S. P. directions are 12 hours). Then allow percolation to proceed slowly, regulating the outflow by raising or lowering the end of the rubber tube, so that the percolate shall not escape faster than 10 to 15 drops per minute. Keep a layer of menstruum above the surface of the drug until the percolation is finished; in this case until 30 Cc. of tincture have been obtained. Preserve the tincture in a bottle and label with the official name.

Prepare*

TINCTURA OPII.

TINCTURE OF OPIUM. Laudanum.

Granulated opium,	10,0 Gm.
Alcohol,	
Water,	
Diluted alcohol, each, enough to make	100,0 Cc.

"Heat 40,0 Cc. of water to boiling, and pour it on the granulated opium contained in a tared vessel, weigh, and stir occasionally during 12 hours; then restore the original weight by the addition of cold water, add 40,0 Cc. of alcohol, pour the mixture into a bottle, and continue the maceration for forty-eight hours, occasionally shaking. Transfer the mixture to a percolator, return the first portion of the percolate until it runs through clear, and when the liquid ceases to drop, continue the percolation slowly, pouring on sufficient diluted alcohol until 100 Cc. are obtained."

"Tincture of opium, when assayed by the process given be-

* The directions for the preparation and assay of the tincture of opium are taken verbatim from the U. S. Pharmacopoeia, eighth decennial revision. It may be of interest and advantage to obtain the tincture of opium to be assayed from a local pharmacy, instead of having the student prepare the tincture.

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low, should contain in 100,0 Cc. not less than 1,2 nor more than 1,25 Gm. of crystallized morphine."

ASSAY OF TINCTURE OF OPIUM.

Tincture of opium,	100,0	Cc.
Ammonia water,	3,5	Cc.
Alcohol,		
Ether,		
Water,		
Lime water, each, a sufficient quantity.		

"Transfer 100 Cc. of tincture of opium to an evaporating dish and evaporate it on a water-bath to about 20 Cc., add 40 Cc. of water, mix thoroughly, and set the liquid aside for one hour, occasionally stirring to disintegrate the resinous flakes adhering to the dish. Then filter the liquid and wash the filter and residue with water, until all soluble matter is extracted (indicated by an almost colorless filtrate), and collect the washings separately. First evaporate the washings, in a tared dish, to a small volume, then add the first filtrate and evaporate the whole to a weight of 14 Gm."

"Rotate the concentrated solution about in the dish until the rings of extract are redissolved, pour the liquid into a tared Erlenmeyer flask having a capacity of about 100 Cc., and rinse the dish with a few drops of water at a time until the entire solution, after the rinsings have been added to the flask, weighs 20 Gm. Then add 10 Gm, (or 12,2 Cc.) of alcohol, shake the flask well, add 25 Cc. of ether, and repeat the shaking. Now add the ammonia water from a graduated pipette or burette, stopper the flask with a sound cork, shake it thoroughly during ten minutes, and then set it aside, in a moderately cool place, for at least six hours, or over night."

"Remove the stopper carefully, and should any crystals adhere to it, brush them into the flask. Place in a small funnel two rapidly-acting filters, of a diameter of 7 Cm., plainly folded, one within the other (the triple fold of the inner filter being laid against the single side of the outer filter), wet them well with ether, and decant the ethereal solution as completely as possible upon the inner filter. Add 10 Cc. of ether to the contents of the flask, rotate it, and again decant the ethereal layer upon the inner filter. Repeat this operation with another por-

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tion of 10 Cc. of ether. Then pour the liquid in the flask into the filter, in portions, in such a way as to transfer the greater portion of the crystals to the filter, and, when the liquid has passed through, transfer the remaining crystals to the filter by washing the flask with several portions of water, using not more than 15 Cc. in all. Use a feather or rubber-tipped glass rod to remove the crystals that adhere to the flask. Allow the double filter to drain, then apply water to the crystals, drop by drop, until they are practically free from mother-liquor, and afterward wash them, drop by drop, from a pipette, with alcohol previously saturated with powdered morphine. When this has passed through, displace the remaining alcohol by ether, using about 10 Cc. or more, if necessary. Allow the filter to dry in a moderately warm place, at a temperature not exceeding 60° C. (140° F.) until its weight remains constant, then carefully transfer the crystals to a tared watch-glass and weigh them."

"Place the crystals (which are not quite pure) in an Erlenmeyer flask, add lime water (10 Cc. for each 0,1 Gm. of morphine) and shake the flask at intervals during half an hour. Pass the liquid through two counterpoised rapidly-acting, plainly-folded filters, one within the other (the triple fold of the inner filter being laid against the single fold of the outer filter), rinse the flask with more lime water and pass the washings through the filter until the filtrate, after acidulating, no longer yields a precipitate with mercuric potassium iodide test solution. Press the filters until nearly dry between bibulous paper and dry them to a constant weight, then weigh the contents, using the outer filter as a counterpoise. Deduct the weight of the insoluble matter on the filter from the weight of the impure morphine previously found. The difference represents the weight in grams of crystallized morphine yielded by 100 Cc. of tincture of opium."

Incompatibilities of tinctures. 1. Aqueous liquids make cloudy mixtures with many tinctures. The student should learn to distinguish between those tinctures that mix clear with water, and those that do not. This may be done by noting the constituents of the drug; the alcoholic strength of the menstruum employed; and finally by actual experiment. When it is desired to prescribe in diluted form a tincture that is incompatible with

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water, the best vehicles are aromatic elixir, brandy, whisky, or wine.

2. Nearly all tinctures made of drugs that are parts of plants contain tannic acid, and should not be mixed with iron preparations; the most prominent exceptions are: Calumba and quassia, which are not incompatible with iron preparations.

3. Tincture of ferric chloride and tincture of sanguinaria are acid in reaction; ammoniated tincture of guaiac and ammoniated tincture of valerian are alkaline; having the incompatibilities of acids and of alkalies respectively.

In **the administration of tinctures,** it must be remembered that alcoholic liquids, on account of their tenuousness, produce small drops, so that a drop is usually about half the size of a drop of aqueous fluid; a point of importance in prescribing doses by drops. Tinctures and other strongly alcoholic liquids are best administered diluted with a little water, or still better with a little milk. The latter is an excellent diluent, covering up the taste of sharp and acrid bodies such as tincture of capsicum, tincture of ginger, etc.

Practice in Prescription-Writing.

PROBLEM 55. Counterirritant in pleurisy. Prescribe 15,0 Cc. of tincture of iodine, and give directions to paint it over the affected part.

PROBLEM 56. Angina pectoris with feeble heart. 30 doses of spirit of glyceryl trinitrate 0,1 Cc. and tincture of strophanthus 0,5 Cc. with compound tincture of cardamom as vehicle. Teaspoonful in wineglassful of water to be taken three times daily after meals.

PROBLEM 57. Antispasmodic in hysteria. Prescribe mixture containing equal parts of: tincture of asafetida, ammoniated tincture of valerian, aromatic spirit of ammonia. Teaspoonful in water every hour until relieved.

CLASS 2. VINA—WINES.

NOM.—*vinum;* gen., *vini;* abbr., *vin.;* gender neuter.

PRONUNCIATION.—Vi'-num.

DEFINITION.— Medicated wines are **tinctures or solutions made**

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with wine as a solvent. Dry white wine is employed for this purpose, and sufficient alcohol added to raise its strength to 20-25 per cent in order to insure better keeping qualities. They have a more pleasant taste than the corresponding tinctures; but are less certain in strength, and have inferior keeping qualities. Being not so strongly alcoholic, they contain less of principles insoluble in water; they are, therefore, freely mixible with water and with alcohol. The dose of the medicated wines varies like that of tinctures.

The following wines are official:

GROUP 1. **Non-medicated wines.**

Vinum album, white wine, a dry white wine, containing not less than 7 per cent, nor more than 12 per cent, by weight, of absolute alcohol.

Vinum rubrum, red wine, a dry red wine, containing not less than 7 per cent, nor more than 12 per cent, by weight, of absolute alcohol.

GROUP 2. **Medicated wines.**

	Composition.	Gm. or Cc. in 100 Cc. of stronger white wine.	Av. Dose.
Vinum antimonii, Wine of antimony.	Antimony and potassium tartrate,	0,40	1,00 Cc.
Vinum cocae, Wine of coca.	Fluidextract of coca,	6,50	
	Sugar,	6,50	
	Red wine,	100,00	16,00 Cc.
Vinum colchici seminis, Wine of colchicum seed.	Fluidextract of cochicum seed,	10,00	2,00 Cc.
Vinum ergotae, Wine of ergot.	Fluidextract of ergot,	20,00	8,00 Cc.
Vinum ferri, Wine of iron.	Iron and ammonium citrate,	4,00	
	Tincture of sweet orange peel,	6,00	
	Syrup,	10,00	8,00 Cc.
Vinum ferri amarum, Bitter wine of iron.	Soluble iron and quinine citrate,	5,00	
	Tincture sweet orange peel,	6,00	
	Syrup,	30,00	8,00 Cc.
Vinum ipecacuanhae, Wine of ipecac.	Fluidextract of ipecac,	10,00	1,00 Cc.
Vinum opii, Wine of opium. (Syn. Sydenham's Laudanum.)	Granulated opium,	10,00	
	Saigon cinnamon,	1,00	
	Cloves,	1,00	0,50 Cc.

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Practice in Prescription-Writing.

PROBLEM 58. Sedative in fever with bounding pulse and violent delirium. 8 doses wine of antimony, 1 Cc.; tincture of opium, 1,0 Cc.; solution of ammonium acetate, enough for tablespoonful to be taken every four or six hours.

CLASS 3. FLUIDEXTRACTA—FLUIDEXTRACTS.

NOM.—*Fluidextractum;* gen., *fluidextracti;* abbr., *fluidextr.;* gender, neuter.

PRONUNCIATION.—Flu-id-ex-trakt'-um.

ORIGIN OF NAME.—From Lat. *extrahere,* to extract, to draw out. Designated "fluid" in order to distinguish them from the "solid" extracts.

DEFINITION.—**Liquid alcoholic preparations of vegetable drugs, of such strength that 1 Cc. contains the active ingredients of 1 Gm. of the drug.**

They are the most concentrated liquid preparations of drugs, and are close competitors of tinctures for rank of importance. They are to be preferred to tinctures in case of non-poisonous drugs, when the dose of the tincture is large and the action of the alcohol may be undesirable; for it must be remembered that all alcoholic preparations, the dose of which contains more than 5 Cc. of absolute alcohol, show the action of the latter. On the other hand, in case of highly active or poisonous drugs, the dose of the fluidextracts is so small that they require dilution in order to facilitate measuring of dose; and, as these preparations are made so very concentrated by evaporation of the menstruum, it seems unwise to go to the trouble of concentrating a liquid which must necessarily again be diluted before use. The still greater objection is that this evaporation cannot be carried on without some loss of active principles. Hence it is wise in case of the poisonous drugs to prescribe tinctures.

The number of official fluidextracts is greater than that of any other class of preparations. As a rule, a fluidextract is

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The dose of fluidextracts is the same as that of the drug. It will be noted that the average dose ranges mostly from 1 to 2 Cc.; except in case of poisonous drugs, when it is generally 0,05 to 0,10 Cc.

The following fluidextracts are official:

	Menstruum, Alcohol Cc. in 100 Cc.	Av. Dose.
Fluidextractum aconiti, Fluidextract of aconite. (Assayed to contain 0,4% of aconitine.)	75,00	0,05 Cc.
Fluidextractum apocyni, Fluidextract of apocynum,	60,00	
Glycerin,	10,00	1,00 Cc.
Fluidextractum aromaticum, Aromatic fluidextract. (Made from aromatic powder.)	100,00	1,00 Cc.
Fuidextractum aurantii amari, Fuidextract of bitter orange peel,	60,00	1,00 Cc.
Fluidextractum belladonnae radicis, Fluidextract of belladonna root. (Assayed to contain 0,5% of mydriatic alkaloids.)	80,00	0,05 Cc.
Fluidextractum berberidis, Fluidextract of berberis,	50,00	2,00 Cc.
Fluidextractum buchu, Fluidextract of buchu,	75,00	2,00 Cc.
Fluidextractum calami, Fluidextract of calamus,	75,00	1,00 Cc.
Fluidextractum calumbae, Fluidextract of calumba,	70,00	2,00 Cc.
Fluidextractum cannabis indicae, Fluidextract of Indian cannabis,	100,00	0,05 Cc.
Fluidextractum capsici, Fluidextract of capsicum,	100,00	0,05 Cc.
Fluidextractum chimaphilae, Fluidextract of chimaphila,	50,00	2,00 Cc.
Fluidextractum chiratae, Fluidextract of chirata,	50,00	1,00 Cc.
Fluidextractum cimicifugae, Fluidextract of cimicifuga.	100,00	1,00 Cc.
Fluidextractum cinchonae, Fluidextract of cinchona. (Assayed to contain 4% of ether-soluble alkaloids,)	80,00	
Glycerin,	10,00	1,00 Cc.
Fluidextractum cocae, Fluidextract of coca. (Assayed to contain 0,5% of ether-soluble alkaloids.)	50,00	2,00 Cc.
Fluidextractum colchici seminis, Fluidextract of colchicum seed. (Assayed to contain 0,5% of colchicine.)	60,00	0,20 Cc.
Fluidextractum conii, Fluidextract of conium. (Assayed to contain 0,45% of coniine.)	50,00	
Acetic acid,	2,00	0,20 Cc.
Fluidextractum convallariae, Fluidextract of convallaria,	65,00	0,50 Cc.
Fluidextractum cubebae, Fluidextract of cubeb,	100.00	1,00 Cc.
Fluidextractum cypripedii, Fluidextract of cypripedium,	50,00	1,00 Cc.
Fluidextractum digitalis, Fluidextract of digitalis,	50,00	0,05 Cc.
Fluidextractum ergotae, Fluidextract of ergot,	50.00	
Acetic acid,	2,00	2,00 Cc
Fluidextractum eriodictyi, Fluidextract of eriodictyon,	80,00	1,00 Cc.

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Fluidextractum eucalypti, Fluidextract of eucalyptus,	75,00	2,00 Cc.
Fluidextractum euonymi, Fluidextract of euonymus,	80,00	0,50 Cc.
Fluidextractum eupatorii, Fluidextract of eupatorium,	50,00	2,00 Cc.
Fluidextractum frangulae, Fluidextract of frangula,	40,00	1,00 Cc.
Fluidextractum gelsemii, Fluidextract of gelsemium,	100,00	0,05 Cc.
Fluidextractum gentianae, Fluidextract of gentian,	50,00	1,00 Cc.
Fluidextractum geranii, Fluidextract of geranium,	60,00	
Glycerin,	10,00	1,00 Cc.
Fluidextractum glycyrrhizae, Fluidextract of glycyrrhiza,	20,00	
Glycerin,	25,00	
Ammonia water,	5,00	2,00 Cc.
Fluidextractum granati, Fluidextract of pomegranate,	50,00	
Glycerin,	10,00	2,00 Cc.
Fluidextractum grindeliae, Fluidextract of grindelia,	75,00	2,00 Cc.
Fluidextractum guaranae, Fluidextract of guarana. (Assayed to contain 3,5% of alkaloids.)	50,00	2,00 Cc.
Fluidextractum hamamelidis foliorum, Fluidextract of hamamelis leaves,	30,00	
Glycerin,	10,00	2,00 Cc.
Fluidextractum hydrastis, Fluidextract of hydrastis. (Assayed to contain 2% of hydrastine.)	60,00	
Glycerin,	10,00	2,00 Cc.
Fluidextractum hyoscyami, Fluidextract of hyoscyamus. (Assayed to contain 0,075% of mydriatic alkaloids.)	60,00	0,20 Cc.
Fluidextractum ipecacuanhae, Fluidextract of ipecac. (Assayed to contain 1,75% of alkaloids.)	75,00	0,05 Cc. to 1,00 Cc.
Fluidextractum krameriae, Fluidextract of krameria,	50,00	1,00 Cc.
Fluidextractum lappae, Fluidextract of lappa,	50,00	2,00 Cc.
Fluidextractum leptandrae, Fluidextract of leptandra.	75,00	1,00 Cc.
Fluidextractum lobeliae, Fluidextract of lobelia. Water,	75,00	
Acetic acid,	25,00	0,50 Cc.
Fluidextractum lupulini, Fluidextract of lupulin,	100,00	0,50 Cc.
Fluidextractum matico, Fluidextract of matico,	75,00	4,00 Cc.
Fluidextractum mezerei, Fluidextract of mezereum,	80,00	
Fluidextractum nucis vomicae, Fluidextract of nux vomica. (Assayed to contain 1% of strychnine.)	75,00	0,05 Cc.
Acetic acid,	5,00	
Fluidextractum pareirae, Fluidextract of pareira,	60,00	
Glycerin,	10,00	2,00 Cc.
Fluidextractum phytolaccae, Fluidextract of phytolacca,	50,00	0,10 Cc. to 1,00 Cc.
Fluidextractum pilocarpi, Fluidextract of pilocarpus. (Assayed to contain 0.4% of alkaloids.)	50.00	2.00 Cc.

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Fluidextractum quassiae, Fluidextract of quassia,	33,00	0,50 Cc.
Fluidextractum quercus, Fluidextract of quercus,	50,00	
Glycerin,	10,00	1,00 Cc.
Fluidextractum quillajae, Fluidextract of quillaja,	50,00	0,20 Cc.
Fluidextractum rhamni purshianae, Fluidextract of cascara sagrada,	40,00	1,00 Cc.
Fluidextractum rhamni purshianae aromaticum, Aromatic fluidextract of cascara sagrada. Contains: cascara sagrada, 100,00; made less bitter by magnesium oxide, glycyrrhiza 10,00, glycerin 25,00; and aromatic by compound spirit of orange 1,00	50,00	1,00 Cc.
Fluidextractum rhei, Fluidextract of rhubarb,	80,00	1,00 Cc.
Fluidextractum rhois glabrae, Fluidextract of rhus glabra,	50,00	
Glycerin,	10,00	1,00 Cc.
Fluidextractum rosae, Fluidextract of rose,	50,00	
Glycerin,	10,00	2,00 Cc.
Fluidextractum rubi, Fluidextract of rubus,	50,00	1,00 Cc.
Fluidextractum sabinae, Fluidextract of savin,	100,00	0,30 Cc.
Fluidextractum sanguinariæ, Fluidextract of sanguinaria. Water,	75,00	
Acetic acid,	25,00	0,10 Cc.
Fluidextractum sarsaparillae, Fluidextract of sarsaparilla,	33,00	2,00 Cc.
Fluidextractum sarsaparillae compositum, Compound fluidextract of sarsaparilla. Contains: sarsaparilla, 75,00; glycyrrhiza, 12,00; sassafras, 10,00; mezereum, 3,00,	50,00	
Glycerin,	10,00	2,00 Cc.
Fluidextractum scillae, Fluidextract of squill. Water,	75,00	
Acetic acid,	25,00	0,10 Cc.
Fluidextractum scopolae, Fluidextract of scopola. (Assayed to contain 0,5% of mydriatic alkaloids.)	80,00	0,05 Cc.
Fluidextractum scutellariae, Fluidextract of scutellaria,	50,00	1,00 Cc.
Fluidextractum senegae, Fluidextract of senega,	66,00	
Solution of potassium hydroxide,	3,00	1,00 Cc.
Fluidextractum sennae, Fluidextract of senna. (Senna previously extracted with alcohol.)	50,00	2,00 Cc.
Fluidextractum serpentariae, Fluidextract of serpentaria,	80,00	1,00 Cc.
Fluidextractum spigeliae, Fluidextract of spigelia,	50,00	4,00 Cc.
Fluidextractum staphisagriae, Fluidextract of staphisagria,	80,00	0,05 Cc.
Fluidextractum stillingiae, Fluidextract of stillingia,	50,00	2,00 Cc.
Fluidextractum stramonii, Fluidextract of stramonium. (Assayed to contain 0,35% of mydriatic alkaloids.)	66,00	0,05 Cc.
Fluidextractum sumbul, Fluidextract of sumbul,	75,00	2,00 Cc.
Fluidextractum taraxaci, Fluidextract of taraxacum,	50,00	
Solution of potassium hydroxide,	5,00	8,00 Cc.
Fluidextractum tritici, Fluidextract of triticum,	25,00	8,00 Cc.
Fluidextractum uvae ursi, Fluidextract of uva ursi.	20,00	
Glycerin,	30,00	2,00 Cc.

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Fluidextractum valerianae, Fluidextract of valerian,	75,00	2,00	Cc.
Fluidextractum veratri, Fluidextract of veratrum,	100,00	0,10	Cc.
Fluidextractum viburni opuli, Fluidextract of viburnum opulus,	66,00	2,00	Cc.
Fluidextractum viburni prunifolii, Fluidextract of viburnum prunifolium,	66,00	2,00	Cc.
Fluidextractum xanthoxyli, Fluidextract of xanthoxylum,	75,00	2,00	Cc.
Fluidextractum zingiberis, Fluidextract of ginger,	100,00	1,00	Cc.

Prepare as example:

FLUIDEXTRACTUM ERGOTAE. FLUIDEXTRACT OF ERGOT.

Ergot, recently ground and in fine powder,	30,0 Gm.
Acetic acid,	0,6 Cc.
Diluted alcohol, a sufficient quantity, to make	
	30,0 Cc.

Mix the acetic acid with 30,0 Cc. of diluted alcohol, and, having moistened the powder with 9 Cc. of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for half hour (U. S. P. directions forty-eight hours). Then allow the percolation to proceed slowly, gradually adding, first, the remainder of the menstruum, and then diluted alcohol, until the ergot is exhausted, i. e., until the menstruum escapes from the percolator quite free of the sensible qualities of ergot. Reserve the first 25,5 Cc. of the percolate,* and evaporate the remainder, in a porcelain dish, at a temperature not exceeding 50°C. (122°F.), to a soft extract; dissolve this in the reserved portion, and add enough diluted alcohol to make the fluidextract measure 30,0 Cc.

The incompatibilities of fluidextracts are similar to those of tinctures. 1. Aqueous liquids with most fluidextracts, especially those containing resinous substances. Obviously the best diluent for a tincture or a fluidextract would be the menstruum, or a fluid as closely as possible approximating its alcoholic strength. Thus, for strongly alcoholic preparations aromatic fluidextract,

* This is done in order to avoid the deleterious effect of heat upon the main mass of the active ingredients, which are contained in the reserved portion.

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or one of the aromatic spirits might serve as vehicle; for less alcoholic fluidextracts or tinctures aromatic elixir; while for those mixible with water, an aromatic water or a flavoring syrup may be used.

2. Iron preparations.

3. Saline substances in great concentration; for such would tend to throw extractive matter out of so concentrated a solution as we find in fluidextracts.

4. The following fluidextracts are acid: Conium, ergot, nux vomica, lobelia, sanguinaria, and squill; alkaline in reaction are: the fluidextracts of glycyrrhiza, senega, taraxacum; they have the incompatibilities of acids and of alkalies respectively.

The administration of fluidextracts is very much like that of tinctures.

Exercise in Prescription-Writing.

PROBLEM 59. Laxative in chronic constipation. Prescribe fluidextract of cascara sagrada (*rhamnus purshiana*). Dose to be taken at bed time.

PROBLEM 60. Chronic bronchitis with feeble heart. 30 doses of fluidextract of squill 0,1 Cc., fluidextract of digitalis 0,05 Cc., with aromatic elixir as vehicle. Teaspoonful every eight hours. Why would ammonium carbonate be incompatible?

PROBLEM 61. Quinine for child. 15 doses of quinine sulphate 0,05 Gm. with fluidextract of glycyrrhiza and syrup to disguise bitter taste. Teaspoonful every four hours. Why would addition of sulphuric acid be incompatible?

DIVISION III. ACETOUS EXTRACTIVE LIQUID PREPARATIONS.

CLASS 1. ACETA. VINEGARS.

NOM.—*Acetum;* gen., *aceti;* gender, neuter.

PRONUNCIATION.—As-e'-tum.

DEFINITION.—**Vinegars are extractive liquid preparations analogous to tinctures, differing from the latter in having dilute acetic acid as menstruum instead of alcohol.**

Vinegar is a good solvent for oils, resins, gum-resins, alka-

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loids, albumens; and it is a fair preservative. It is therefore quite a good menstruum for the extraction of drugs, for which purpose it has been used since the days of Hippocrates. The medicated vinegars are, however, not a very elegant class of preparations, nor do they keep very well. For these reasons vinegar as a menstruum has been largely superseded by alcohol; so that at present only two vinegars are official. It must be pointed out, however, that there are three official fluidextracts that are made with dilute vinegar as menstruum; and for this reason would properly belong among the vinegars, were it not for the fact that their strength corresponds to that of fluidextracts; they are the fluidextracts of lobelia, of sanguinaria, and of squill.

The official vinegars are:

			Av. Dose.
Acetum opii,	Powdered opium,	10,00	0,50 Cc.
Vinegar of opium. (Syn. Black drop.)	Nutmeg,	3,00	
	Sugar,	20,00	
	Dilute acetic acid, to make,	100,00	
Acetum scillae,	Squill,	10,00	
Vinegar of squill.	Dilute acetic acid, to make,	100,00	1,00 Cc.

The official vinegars may be mixed with aqueous, syrupy, or alcoholic liquids. They are, however, acid in reaction, and must not be prescribed with alkalies, alkaline carbonates, or other substances incompatible with acids.

DIVISION IV. OILY EXTRACTIVE LIQUID PREPARATIONS.

CLASS 1. OLEORESINAE—OLEORESINS.

NOM.—*Oleoresina;* gen., *oleoresinae;* abbr., *oleores.;* gender, female.

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tion; forming the strongest liquid preparations of vegetable substances. The dose of oleoresins is therefore small. They are best prescribed in pills, capsules, or emulsions.

The following oleoresins are official:

	Av. Dose.
Oleoresina aspidii, Oleoresin of aspidium,	2,00 Gm.
Oleoresina capsici, Oleoresin of capsicum,	0,03 Gm.
Oleoresina cubebae, Oleoresin of cubeb,	0,50 Gm.
Oleoresina lupulini, Oleoresin of lupulin,	0,20 Gm.
Oleoresina piperis, Oleoresin of pepper,	0,03 Gm.
Oleoresina zingiberis, Oleoresin of ginger,	0,03 Gm.

Prepare as example:

OLEORESINA ASPIDII. OLEORESIN OF ASPIDIUM.
(Oleoresin of Male Fern.)

Aspidium, in moderately coarse powder, 10,0 Gm.
Acetone, a sufficient quantity.

Pack the aspidium firmly in a percolator, provided with a cover, and percolate slowly with acetone, added in successive portions, until the aspidium is exhausted. Evaporate the acetone by surrounding the liquid, contained in an evaporating dish, with hot water, keeping away all flames from the apparatus. Lastly fill the oleoresin in gelatin capsule. Weigh the product and preserve capsule in a pasteboard box. Label with official name.

Practice in Prescription-Writing.

PROBLEM 62. Tape-worm remedy. Oleoresin of aspidium 8,0 Cc. with emulsion of almond, enough for 120 Cc., to be taken at bed time in two doses, about 20 minutes apart.

SUBORDER B.

SOLID EXTRACTIVE PREPARATIONS.

CLASS 1. EXTRACTA—EXTRACTS.

NOM.—*Extractum;* gen., *extracti;* abbr., *extr.;* gender, neuter.
PRONUNCIATION.—Lat., ex-trakt'-um; Eng., ex'-trakt.
ORIGIN OF NAME.—See under fluidextract.
DEFINITION.—**Solid or semisolid preparations obtained by evaporation of solutions of vegetable principles.**

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These preparations are often spoken of as "solid extracts," and must not be confused with the fluidextracts. So called "aqueous" or "alcoholic" extracts are not liquids, but are solid preparations in which water or alcohol has been used to extract the active principles from the drug; they are soluble in the respective liquid; aqueous extracts, in water; alcoholic extracts, in alcohol. Most of the extracts are of pillular consistence; i. e., exactly adopted for pill making, though some are dry powders. Extract of malt differs from the other extracts in having the consistence of thick honey.

They are especially adapted for administration in solid or semi-solid form—e. g., in pills, ointments, plasters, etc.—and for this reason must be considered one of the three most important preparations of vegetable drugs. The other two are fluidextract and tincture. Extracts are liable to have, however, the great drawback of uncertainty in strength because on evaporating to pillular consistence it is impossible to regulate precisely the amount of moisture present in the finished product. The powdered extracts do not suffer from this source of uncertainty; but both are likely to have their active principles injured by the prolonged applications of heat. For these reasons the solid extracts of poisonous drugs have been standardized by the pharmacopœia wherever possible.

The dose of extracts varies considerably. As a general proposition, the dose of poisonous extracts is 0,01 Gm.; of potent extracts, 0,25 Gm.; of harmless extracts, 1 Gm., with exception of extract of malt, the dose of which is 16 Gm.

The following extracts are official:

	Av. Dose.
Extractum aloes, Extract of aloes,	0,125 Gm.
Extractum belladonnae foliorum, Extract of belladonna leaves. (Assayed to contain 1,4% of mydratic alkaloids.)	0,01 Gm.
Extractum cannabis indicae, Extract of Indian cannabis,	0,01 Gm.
Extractum cimicifugae, Extract of cimicifuga,	0,25 Gm.
Extractum colchici cormi, Extract of colchicum corm. (Assayed to contain 1,4% of colchicine.)	0,065 Gm.
Extractum colocynthidis, Extract of colocynth	0,03 Gm.

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Extractum euonymi, Extract of euonymus,	0,125	Gm.
Extractum gentianae, Extract of gentian,	0,25	Gm.
Extractum glycyrrhizae, Extract of glycyrrhiza,	1,00	Gm.
Extractum glycyrrhize purum, Pure extract of glycyrrhiza,	1,00	Gm.
Extractum haematoxyli, Extract of hematoxylon,	1,000	Gm.
Extractum hyoscyami, Extract of hyoscyamus. (Assayed to contain 0,3% of mydriatic alkaloids.)	0,065	Gm.
Extractum krameriae, Extract of krameria,	0,500	Gm.
Extractum leptandrae, Extract of leptandra,	0,250	Gm.
Extractum malti, Extract of malt,	16,000	Gm.
Extractum nucis vomicae, Extract of nux vomica. (Assayed to contain 5% of strychnine.)	0,015	Gm.
Extractum opii, Extract of opium. (Assayed to contain 20% of morphine.)	0,030	Gm.
Extractum physostigmatis, Extract of physostigma. (Assayed to contain 2% of ether soluble alkaloids.)	0,008	Gm.
Extractum quassiae, Extract of quassia,	0,065	Gm.
Extractum rhamni purshianae, Extract of cascara sagrada,	0,250	Gm.
Extractum rhei, Extract of rhubarb,	0,250	Gm.
Extractum scopolae, Extract of scopola. (Assayed to contain 2% of mydriatic alkaloids.)	0,010	Gm.
Extractum amonii, Extract of stramonium. (Assayed to contain 1,4% of mydriatic alkaloids.)	0,010	Gm.
Extractum sumbul, Extract of sumbul,	0,250	Gm.
Extractum taraxaci, Extract of taraxacum,	1,000	Gm.

Prepare as example:

EXTRACTUM GENTIANAE. EXTRACT OF GENTIAN.

Gentian, in coarse powder, 10 Gm.
Water, a sufficient quantity.

Moisten the powder with 4 Cc. of water, and let it macerate for 30 minutes (U. S. P. directions are 24 hours); then pack it in a conical percolator (funnel), and gradually pour water upon it until the infusion passes but slightly imbued with the properties of the gentian. Reduce the liquid to three-fourths of its bulk by boiling, and strain; then, by means of a water-bath, evaporate to a pillular consistence. Divide into pills of 0,25 Gm. each,* dust with lycopodium, preserve in pill box, and label.

Practice in Prescription-Writing.

PROBLEM 63. Anodyne pigment in mastitis. Equal parts of extract of belladonna leaves and glycerin to be applied under poultice.

* To weigh extract of gentian counterpoise two slips of paper on the scale pans. Should, on removing the extract from the paper, some of the extract stick to it, moisten the opposite side of the paper with water, wait a few moments, when the extract may be easily scraped off.

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CLASS 2. RESINAE.—RESINS.

NOM.—*Resina;* gen., *resinae;* abbr., *res.;* gender, female.

PRONUNCIATION.—Lat., rez-i'-nah. Eng., rez'-in.

DEFINITION.—**A class of solid preparations made by pouring concentrated alcoholic tinctures into water and collecting and washing the precipitate.** It is obvious that the substances thus prepared are not pure principles,* but contain all the ingredients of the drug that are soluble in alcohol and insoluble in water. They differ from alcoholic extracts in not containing substances that are soluble in water, and are superior to such extracts in case of drugs whose activity depends entirely upon resinous principles. Their dose, as will be seen, is small.

The following resins are official:

		Av. Dose.
Resina jalapae, Resin of jalap,		0,125 Gm.
Resina podophylli, Resin of podophyllum,	Purgative,	0,015 Gm.
	Laxative,	0,005 Gm.
Resina scammonii, Resin of scammony,		0,200 Gm.

Prepare as example:

RESINA SCAMMONII. RESIN OF SCAMMONY.

Scammony, in fine powder,	5 Gm.
Alcohol,	
Water, each, a sufficient quantity.	

Digest the scammony with successive portions of boiling alcohol until it is exhausted. Mix the liquids, filter, and reduce the mixture to a syrupy consistence by evaporating the alcohol. Then add the residue in a thin stream, with active stirring, to 12 Cc. of water, separate the precipitate formed, wash it thoroughly with water, and dry it at a gentle heat.

Practice in Prescription-Writing.

PROBLEM 64. Cholagogue drops. Prescribe a solution of the resin of podophyllum in alcohol, of such strength that the dose be five drops to be taken on sugar night and morning.

* The eclectic resinoids are prepared in the same way as the official resins. The names which the practitioners, styling themselves "eclectics" have applied to these resinous precipitates end in *in*, which, in its proper scientific use, should be restricted to true proximate principles and not applied to mixtures of such. This want of discrimination often leads to annoyance and mistakes in dispensing.

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ORDER III. SOLID PREPARATIONS FOR INTERNAL USE.

Division 1. Powdered Substances.
- Class 1. Powders.
- Class 2. Triturations.
- Class 3. Oil--sugars.
- Class 4. Effervescent powders.
- Class 5. Species.

Division 2. Massed Substances.
- Class 1. Masses.
- Class 2. Confections.

Division 3. Dosage Forms.
- Class 1. Pills.
- Class 2. Lozenges.
- Class 3. Tablets.
- Class 4. Capsules.
- Class 5. Suppositories.

These form a most important group of pharmaceutic preparations which are becoming more and more popular because of their portability, concentration, accuracy of dosage, convenience of administration and ease with which objectionable taste and odors may be disguised. For these reasons, the following rule may be adopted: **Never prescribe medicines in liquid form, when they can just as well be prescribed in solid form.**

Solid preparations are of special importance for the administration of water-insoluble drugs, for which mixtures are an old-fashioned and most objectionable form.

Another fact of great importance that serves to recommend the solid preparations for internal use is the accuracy with which medicaments may be made to limit their action to certain parts of the digestive tract by choosing the proper kind of preparation. Thus, lozenges by being dissolved in the mouth, furnish a prolonged contact with diseased surfaces in mouth and throat. Powders, in their various dosage forms, are especially adapted for medication of the stomach itself, as well as for systemic action, for which solution is necessary; powders passing more quickly in solution than any other form of solid medication.

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Pulvis effervescens compositus, Compound effervescing powder. (Syn. Seidlitz powder.)	Sodium bicarbonate.	2.58	
	Potass. and sod. tart., in blue powder paper.	7.75	
	Tartaric acid, in white powder paper,	2.25	1 set.
Pulvis glycyrrhizae compositus, Compound powder of glycyrrhiza.	Senna.	18.00	
	Glycyrrhiza.	23.60	
	Washed sulphur,	8.00	
	Oil of fennel,	0.40	
	Sugar.	50.00	4.00 Gm.
Pulvis ipecacuanhae et opii. Powder of ipecac and opium. (Syn. Dover's powder.)	Ipecac.	10.00	
	Powdered opium,	10.00	
	Sugar of milk,	80.00	0.50 Gm.
Pulvis jalapae compositus, Compound powder of jalap.	Jalap.	35.00	
	Potassium bitartrate,	65.00	2.00 Gm.
Pulvis morphinae compositus. Compound powder of morphine. (Syn. Tully's powder.)	Morphine sulphate.	1.50	
	Camphor.	32.00	
	Glycyrrhiza.	33.00	
	Precipitated calcium carbonate.	33.50	0.50 Gm.
Pulvis rhei compositus, Compound powder of rhubarb.	Rhubarb.	25.00	
	Magnesium oxide,	65.00	
	Ginger.	10.00	2.00 Gm.

It will be noted that the dose of the official powders varies from 0.5 to 2.0 Gm.; only the compound powder of glycyrrhiza is given in large doses, average 4.0 Gm.

Prepare—

PULVIS EFFERVESCENS COMPOSITUS.

Compound Effervescing Powder.

Sodium bicarbonate, in fine powder,	2.58 Gm.
Potassium and sodium tartrate, in fine powder,	7.75 Gm.
Mix intimately and wrap in a blue paper.	
Tartaric acid, in fine powder,	2.25 Gm.
Wrap in white paper.	

To fold powder papers, crease them all at once by folding down a margin on the long side, so that this crease shall be uni-

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For action upon the intestine, on the other hand, pills with various readily soluble coatings are especially eligible; while it is possible to act upon the lower part of the intestinal tract, especially the colon, by coating the pills with certain substances, such as salol, keratin, which are insoluble in the secretions of the upper part of the digestive tract, but soluble in the lower portions.

Never prescribe pills, capsules, tablets, or cachets to infants, or small children, as they cannot be made to swallow them.

While incompatibility by precipitation plays no role in prescribing solid preparations, liquifaction and explosive compounds must be guarded against.

DIVISION I. POWDERED SUBSTANCES.

CLASS 1. PULVERES. POWDERS.

NOM.—*Pulvis;* gen., *pulveris;* abbr., *pulv.;* gender, male.

PRONUNCIATION.—Pul'-vis.

DEFINITION.—**The official powders are a combination of several substances in state of fine subdivision** intended for internal use.

The name of the official powders, following the rule of sequence given on page 11, has the word *pulvis* precede; as in *pulvis ipecacuanhae et opii.* When, on the other hand, *pulvis* is used in the sense "powdered," it follows the genitive, as in *opii pulvis.*

The following powders are official:

	Composition.	Gm.	Av. Dose.
Pulvis acetanilidi compositus, Compound Acetanilide powder.	Acetanilide,	70,00	
	Caffeine,	10,00	
	Sodium bicarbonate,	20,00	0,50 Gm.
Pulvis aromaticus, Aromatic powder.	Saigon cinnamon,	35,00	
	Ginger,	35,00	
	Cardamom,	15,00	
	Nutmeg.	15.00	1.00 Gm.

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Pulvis effervescens compositus, Compound effervescing powder. (Syn. Seidlitz powder.)	Sodium bicarbonate,	2,58	
	Potass. and sod. tart., both in blue powder paper,	7,75	
	Tartaric acid, in white powder paper,	2,25	**1 set.**
Pulvis glycyrrhizae compositus, Compound powder of glycyrrhiza.	Senna,	18,00	
	Glycyrrhiza,	23,60	
	Washed sulphur,	8,00	
	Oil of fennel,	0,40	
	Sugar,	50,00	4,00 Gm.
Pulvis ipecacuanhae et opii, Powder of ipecac and opium. (Syn. Dover's powder.)	Ipecac,	10,00	
	Powdered opium,	10,00	
	Sugar of milk,	80,00	0,50 Gm.
Pulvis jalapae compositus, Compound powder of jalap.	Jalap,	35,00	
	Potassium bitartrate,	65,00	2,00 Gm.
Pulvis morphinae compositus, Compound powder of morphine. (Syn. Tully's powder.)	Morphine sulphate,	1,50	
	Camphor,	32,00	
	Glycyrrhiza,	33,00	
	Precipitated calcium carbonate,	33,50	0,50 Gm.
Pulvis rhei compositus, Compound powder of rhubarb.	Rhubarb,	25,00	
	Magnesium oxide,	65,00	
	Ginger,	10,00	2,00 Gm.

It will be noted that **the dose** of the official powders varies from 0,5 to 2,0 Gm.: only the compound powder of glycyrrhiza is given in large doses, average 4,0 Gm.

Prepare—

PULVIS EFFERVESCENS COMPOSITUS.

Compound Effervescing Powder.

Sodium bicarbonate, in fine powder,	2,58 Gm.
Potassium and sodium tartrate, in fine powder,	7,75 Gm.
Mix intimately and wrap in a blue paper.	
Tartaric acid, in fine powder,	2,25 Gm.
Wrap in white paper.	

To fold powder papers, crease them all at once by folding down a margin on the long side, so that this crease shall be uniform. Transfer each powder to its appropriate paper. Now the edge of the paper opposite the crease is brought over so as to lie exactly in the crease; and the margin is turned down over

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it. Then the turned-down margin with the uncreased edge underneath it is folded over toward the operator, the depth of the fold determining the width of the powder. The length of the parcel is determined by the placing of the end-creases, which complete the enclosure of the powder. To place these right, it is well to use the sides of the powder box in which the powders are to be dispensed as a gauge. Finish by pressing down the folds with the blade of the spatula.

Mix the two powders in half a tumblerful of water; and note result. The dose is taken while effervescing; its effect is purgative.

In the compound effervescing powder, the sodium bicarbonate and the tartaric acid impart the effervescing quality to the medicament, which is the potassium and sodium tartrate. By substituting other medicament for the latter, effervescing powders of other action may be obtained.

The Prescribing of Powders.

We may prescribe any of the official powders by merely writing the official name. If we desire to prescribe a powder combination that is not found in the pharmacopœia, we will, of course, have to name each ingredient and its quantity. The subscription would be: simply *misce*, (mix; abbr *m.*), if all the ingredients are already in fine powder; or, if any of the ingredients are in lumps or crystals: *misce, fiat pulvis*, (mix, let a powder be made; abbr. *m., ft. pulv.*) Such powder combination is known as an **extemporaneous** powder in contradistinction to the official powders; the word extemporaneous being derived from the Latin *ex tempore*, literally out of time, meaning proceeding from the impulse of the moment. This word is applied not only to powders, but also to all other formulæ written by the physician to meet the peculiar requirements of an individual patient at the time of writing.

Administration in powder form is best suited for insoluble solids whose dose is too bulky for pills or tablets. Of course,

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cent, and volatile substances are not well suited for administration in powder form; though they may be dispensed in waxed paper. Caustic or very irritant substances should not be given in this form, unless largely diluted with some inert powder. A diluent is also necessary if the dose of the medicament is very small, as e. g. in the case of mild mercurous chloride, for otherwise the patient might not be able to find his dose. Diluents available for these purposes are: Sugar of milk, cane sugar, oil sugars, powdered starch, powdered glycyrrhiza, or the aromatic powder.

Powders may be dispensed (*a*) in bulk, or (*b*) in divided doses.

(*a*) **Powders in bulk.** When the dose of the powder exceeds 1 or 2 Gm., especially if the weight need not be very exact, and if the taste of the powder is not disagreeable, it is best prescribed in bulk; the dose being measured, when wanted, with a teaspoon or other appropriate measure. For the purpose of approximating doses, it may be assumed that a heaped teaspoonful contains about 1 to 2 Gm. of a light powder; 2 to 4 Gm. of a moderately heavy; 4 to 8 Gm. of a heavy powder. If level full, it contains only about half as much. Powders in bulk may be sent to the patient in a paper box, or in a wide-mouthed bottle; the latter should always be selected, if the powder is liable to be altered by free access of air. The subscription would therefore either be: *detur in scatula* (let it be given in a box), or *detur in vitro* (let it be given in glass), according to the permanence of the powder.

(*b*) Powders must be dispensed **in divided doses,** whenever accuracy in dosing is necessary. The following dosage forms may be used:

1. Powder papers, if the taste is not unpleasant. The dose may be quite large.

2. Capsules, always to be used, if the taste is unpleasant. (To be studied subsequently.)

3. Tablets, if the dose is rather small. (To be studied subsequently.)

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a paper. The contents of these little papers should, as a general proposition, not weigh more than 1 or 2 Gm., nor less than 0,2 Gm. If the dose is much smaller than 0,2 Gm., some diluent powder should be used. The taste of substances, to be thus dispensed, must not be unpleasant. In writing prescriptions for powders to be divided into papers, the whole quantity of each drug is put down; the ingredients are then directed to be mixed, and to be divided into the desired number of doses by the following subscription: *misce et fiat pulvis; divide in chartulas*——* (meaning: mix and let a powder be made; divide it into —— papers; frequently abbreviated: *m. et ft. pulv.; div. in chart.* ——.*) Of course, *misce* is omitted, if there is only one ingredient; and *fiat pulvis* is omitted, if powdering is unnecessary.

If the powders contain a volatile or a deliquescent substance, they must be wrapped in waxed paper, which may be specified by using the subscription: *divide in chartulas ceratas*, divide into waxed papers. It is better, however, not to dispense such substances in powder form.

The patient may be directed to take the powder in water, milk, or syrup, or he may place the dry powder on the tongue and swallow it down with a mouthful of water. Powders are most conveniently administered to infants by dipping the moistened finger into the powder and smearing it over the infant's tongue.

Compound the following prescription:

℞

Hydrargyri chloridi mitis,	0,05 Gm.
Sacchari lactis,	0,80 Gm.

Misce et fiat pulvis; divide in chartulas iv.
Sig.: One powder every hour.

In dividing the powder, it is not necessary to weigh out each powder. The object is generally accomplished with sufficient accuracy by flattening the powder on a piece of paper, squaring off the edges, and dividing into a number of equal parts by means of a spatula. The powders are to be wrapped in powder papers, as previously directed.

* Number in Roman numerals.

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Practice in Prescription-Writing.

PROBLEM 65. Laxative. Prescribe about 8 doses of the compound powder of glycyrrhiza. To be dispensed in a box. Teaspoonful to be taken in a little water at bed time as needed.

PROBLEM 66. Saline laxative. 30 doses of sodium phosphate. As this salt is efflorescent, it is well to dispense it in a bottle. Half teaspoonful is to be taken every morning.

PROBLEM 67. Diaphoretic. Two doses of 0,5 Gm. each of powder of ipecac and opium. One to be taken at bed time.

PROBLEM 68. For headache. Prescribe 10 powders, each containing acetphenetidin, 0,3 Gm.; and citrated caffeine, 0,1 Gm. One powder every hour for three doses, if necessary.

PROBLEM 69. Antidiarrheal. Deodorized opium, 0,01 Gm.; phenyl salicylate, 0,50 Gm.; bismuth subnitrate, 1,0 Gm. Prescribe 15 doses. One to be taken every two hours.

PROBLEM 70. For epilepsy. Prescribe effervescing powders patterned after the official compound effervescing powder, containing, however, only one-half of the effervescing ingredients (sodium bicarbonate and tartaric acid) and 2 Gm. of potassium bromide instead of the potassium and sodium tartrate in the official powder. Prescribe 20 such doses; with the transcription that the contents of one blue and one white paper be mixed in half a tumblerful of water, and taken during effervescence three times daily after meals.

CLASS 2. TRITURATIONES. TRITURATIONS.

(Triturates.)

NOM.—*Trituratio;* gen., *triturationis;* abbr., *trit.;* gender, female.

PRONUNCIATION.—Trit-u-ra'-sho.

DERIVATION.—From Lat., *tritus,* a rubbing.

DEFINITION.—**Triturations are powders obtained by rubbing the active substance with some inert material, such as sugar of milk.**

Their advantage lies in the greater ease in weighing out a

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comparatively large amount of substance. Furthermore, the rubbing to a very fine powder increases the activity of sparingly soluble substances by exposing a greater surface to the solvent. Hence sparingly soluble, potent drugs are often best dispensed in this form.

The pharmacopœia contains a general formula for triturations, which is to be used by the pharmacist, unless he is otherwise directed.

General Formula.

The Substance,	10 Gm.
Sugar of Milk,	90 Gm.
To make	100 Gm.

Weigh the substance and the sugar of milk separately; then place the substance, previously reduced, if necessary, to a moderately fine powder, in a mortar; add about an equal measure of sugar of milk, mix well by means of a spatula, and triturate the powders thoroughly together. Then add fresh portions of the sugar of milk, from time to time, until the whole is added, and continue the trituration after each addition until the substance is intimately mixed with the sugar of milk and reduced to a fine powder.

Only one trituration is official:

	Composition.	Av. Dose.
Trituratio elaterini	Elaterin, 10,0	0,03 Gm.
Trituration of elaterin.	Sugar of Milk, 90,0	

Practice in Prescription-Writing.

PROBLEM 71. Hydragogue cathartic in dropsy. Prescribe four doses of trituration of elaterin, with the addition of 0,06 Gm. of extract of hyoscyamus to each dose to antagonize griping, and enough sugar of milk to change the pilular consistence of the extract to that of a powder. Give directions to take one powder on alternate mornings.

Compound above prescription.

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CLASS 3. OLEOSACCHARA, N. F.* OIL-SUGARS.

(Eleosacchara, Germ. Phar.)

NOM.—*Oleosaccharum;* gen., *oleosacchari;* abbr., *oleosacch.;* gender, neuter.

PRONUNCIATION.—O-le-o-sak-ar'-um.

DEFINITION.—**Mixtures of volatile oils with powdered sugar.**

GENERAL FORMULA:

Any volatile oil,	1 drop
Sugar,	2,00 Gm.

Triturate the sugar with the volatile oil until they are intimately mixed.

Oleosaccharum anisi, oleosaccharum menthae piperitae, etc. are prepared from the corresponding volatile oil, according to the above formula. They should be freshly made, when wanted. They are used mainly as pleasant diluents for powders.

Practice in Prescription-Writing.

PROBLEM 72. Sedative stomachic. Prescribe 0,5 Gm. each of bismuth subnitrate and oil-sugar of peppermint, to be dispensed in waxed paper. Dose to be taken three times daily before meals.

CLASS 4. PULVERES EFFERVESCENTES. EFFERVESCENT POWDERS.

(Granular Effervescent Salts.)

NOM.—*Pulvis effervescens;* gen., *pulveris effervescentis;* abbr., *pulv. eff.,* gender, male.

PRONUNCIATION.—Pul'-vis ef-er-ves'-ens.

DEFINITION.—**Effervescent powders are composed of the medicinal agent in admixture with an alkaline bicarbonate, an organic acid, and sugar.**

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rendering them more agreeable to the palate, more acceptable to the stomach and favoring their absorption.

The effervescence is produced by the presence of nearly molecular proportions of sodium bicarbonate, (83.5 parts) and citric acid (70 parts), or tartaric acid (75 parts); or both acids, as in the official formula; the citric acid procuring better granules, the tartaric acid being less expensive. When this mixture is thrown into water, the vegetable acid combines with the sodium and liberates carbon dioxide, which causes the effervescence; a slight excess of acid being present to give a pleasant acidulous taste. To this effervescing basis the medicament is added in such proportion that the dose of the powder may be a teaspoonful (about 4 Gm.), a dessertspoonful (about 8 Gm.), or a tablespoonful (about 16 Gm.). The powders are mixed dry; and, if desired in granular form, they are then granulated by heating them between 93° and 104°C., until the mass coheres sufficiently to form small granular lumps after being rubbed through a coarse sieve.

These powders should be kept and dispensed in tightly stoppered bottles, as the moisture of the atmosphere causes a slow reaction to take place between the ingredients, with consequent impairment or even loss of effervescence. When wanted, the dose is put in half a tumblerful of water and taken during effervescence.

Almost any salt or mixture of salts can be put in effervescing form. Only five effervescent salts are official. These are:

		Av. Dose.
Caffeina citrata effervescens, Effervescent citrated caffeine,		
Containing Citrated caffeine,	4%	4,00 Gm.
Lithii citras effervescens, Effervescent lithium citrate,		
Containing Lithium citrate,	5%	8,00 Gm.
Magnesii sulphas effervescens, Effervescent magnesium sulphate,		
Containing Magnesium sulphate,	50%	16,00 Gm.
Potassii citras effervescens, Effervescent potassium citrate,		
Containing Potassium citrate,	20%	4,00 Gm.

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The National Formulary contains a number of useful formulæ for effervescent salts, among which may be mentioned the following, as they enable us to produce artificial mineral waters that resemble the natural mineral waters in the essential ingredients.

	Dose in 180 Cc. of Water.
Pulvis salis carolini factitii, N. F., Effervescent artificial Carlsbad salt,	6,00 Gm.
Pulvis salis kissingensis factitii effervescens, N. F., Effervescent artificial Kissingen salt,	5,00 Gm.
Pulvis salis vichyani factitii effervescens, N. F., Effervescent artificial Vichy salt,	4,00 Gm.

An official effervescent salt would be prescribed as follows:

℞ Sodii phosphatis effervescentis, 120,00 Gm.
Detur in vitro.
Sig. Dessertspoonful in half tumblerful of water before breakfast.

The writing of extemporaneous prescriptions for effervescent salts is greatly facilitated by the presence in the National Formulary of the following three preparations:

Sodii bicarbonas saccharatus, N. F., saccharated sodium bicarbonate.

Acidum tartaricum saccharatum, N. F., saccharated tartaric acid.

Acidum citricum saccharatum, N. F., saccharated citric acid.

The proportion of sugar in these powders is so adjusted that when either of the acid saccharates is mixed with an equal weight of the alkaline saccharate, the acid and alkali are in molecular relation to each other. The proportion of the medicinal agent to be added is, of course, dependent upon the dose, in the prescribing of which it may be remembered that a heaped teaspoonful of the finished product will weigh about 4 Gm. For example:

℞ Sedative.
Sodii bromidi, 20,0 Gm.
Sodii bicarbonatis saccharati, N. F.,
Acidi tartarici saccharati, N. F., āā. 40,0 Gm.
Misce et fiat pulvis effervescens: detur in vitro.
Sig. Heaped teaspoonful in half tumblerful of water three times daily after meals.

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Permitting the preparation to be dispensed in form of fine powder greatly simplifies its dispensing. The granular form, though popular, has hardly any special advantages.

Practice in Prescription-Writing.

PROBLEM 73. For nervous headache. Prescribe the official effervescent citrated caffeine.

PROBLEM 74. For morning headache. Prescribe ten doses of sodium salicylate, 0,5 Gm.; and potassium bromide, 2 Gm. in form of effervescent powder. Dose to be taken at bed-time.

CLASS 5. SPECIES. SPECIES.

(Teas.)

NOM.—Plural, *species;* gen., *specierum;* abbr., *spec.*, gender, female.

PRONUNCIATION.—Spe′-shēz.

DEFINITION.—**A mixture of very coarse vegetable powders, intended for the domestic preparation of infusions or decoctions.**

They are much more frequently called for by the laity than prescribed by the physician. Still, as they sometimes serve a useful purpose, the physician should know how to prescribe them. In prescription for species the ingredients are enumerated; and unless they are already in form of coarse powder, either *concisus,-a,-um* (cut), or *contusus,-a,-um* (crushed) is written after the names of the vegetable substances. The subscription would be: *misce et fiant species*, meaning, mix and let species be made; abbreviated, *m. ft. spec.* For instance:

℞

Purgative tea.

Sennae concisae,	20,0 Gm.
Foeniculi contusi,	5,0 Gm.
Potassii bitartratis,	5,0 Gm.

Misce et fiant species.

Sig. Use one-fourth to a cup of boiling water to make tea.

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pectorales, N. F., pectoral species, (Syn. Breast Tea), containing althaea, tussilago, glycyrrhiza, anise, mullein, orris. Dose: Infusion (1: 10) teacupful. Species laxantes, N. F., laxative species, (Syn. St. Germain Tea). Dose: 4 to 15 Gm. as infusion. Senna (40%), cream of tartar, elder flowers, fennel and anise.

DIVISION 2. MASSED SUBSTANCES.

CLASS 1. MASSAE. MASSES.

NOM.—*Massa;* gen., *massae;* gender, female.

PRONUNCIATION.—Mas'-ah.

DEFINITION.—**Masses are soft solid preparations of such consistency that they can be made into pills.** They are kept on hand in bulk and are divided into pills as occasion requires.

Only two masses are official:

	Composition.	Av. Dose.
Massa ferri carbonatis, Mass of ferrous carbonate. (Syn. Vallet's mass.)	Ferrous carbonate, protected from oxidation by sugar and honey,	0,25 Gm.
Massa hydrargyri, Mass of mercury. (Syn. Blue mass.)	Mercury, 33%, in very fine subdivision,	0,25 Gm.

Method of prescribing masses:

℞

Massae hydrargyri, 1,0 Gm.
Divide in pilulas iii.
Sig. Take one at bed-time.

Practice in Prescription-Writing.

PROBLEM 75. Prescribe 20 pills, each containing 0,2 Gm. of mass of ferrous carbonate, with directions to take one three times daily after meals.

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DEFINITION.—**Soft pasty solids composed of medicinal agents, saccharine and flavoring matter; intended to be eaten, or dissolved in the mouth, like candy.**

Confections furnish a means of administering a number of drugs in an agreeable form. They are especially useful for children. They are less frequently used than formerly, having been displaced by their dosage form, the lozenges. Confections are dispensed in jars or in wide-mouthed bottles. Small lumps of a size approximating some familiar object, or spoonfuls are directed to be taken at a time.

Only two confections are official:

	Composition.	Gm. or Cc.	Av. Dose.
Confectio rosae, Confection of rose.	Red rose, in fine powder,	8,00	
	Sugar, in fine powder,	64,00	
	Clarified honey,	12,00	
	Stronger rose water,	16,00	
Confectio sennae, Confection of senna.	Senna,	10,00	
	Cassia fistula,	16,00	
	Tamarind,	10,00	
	Prune,	7,00	
	Fig,	12,00	
	Sugar,	55,50	
	Oil of coriander,	0,50	
	Water, sufficient to make,	100,00	4,00 Gm.

Official confections are prescribed by writing the name and the quantity merely, thus:

℞

Confectionis sennæ, 30,0 Gm.
Sig. Teaspoonful at bed-time.

Prescriptions for extemporaneous confections enumerate the ingredients, which must not be soluble unless the quantity of insoluble powder is greatly in excess. Lastly the massing agent (excipient) is named, e. g., honey, syrup, or confection of rose; the amount necessary to be taken being left to the judgment of the pharmacist by ordering *q. s.* The subscription is: *misce et fiat confectio,* mix and let a confection be made, abbreviated *m. et ft. confect.* Thus, for example:

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℞ Cough Remedy.

	Gm. vel Cc.
Cubebæ pulveris,	8,0
Extracti glycyrrhizæ,	16,0
Olei gaultheriæ,	0,3
Confectionis rosæ,	30,0
Glycerini,	q. s.

Misce et fiat confectio.

Sig. Take a piece about the size of a pea every four hours.

Practice in Prescription-Writing.

PROBLEM 76. Laxative confection. Prescribe about 100 Gm. of confection containing: washed sulphur, 2 parts; potassium bitartrate, 1 part; sugar, 1 part; syrup of orange, as excipient. Teaspoonful at bed-time.

DIVISION 3. SOLID DOSAGE FORMS.

CLASS 1. PILULAE. PILLS.

NOM.—*Pilula;* accusative plural,* *pilulas;* abbr., *pil.;* gender, female. Note that the proper abbreviation for pilula is written with only one *l*, the word being derived from *pilum*, a ball, which has only one *l* in its root.

PRONUNCIATION.—Pil'-u-lah.

DEFINITION.—**Pills are round, oval, or ovoid forms of medicinal masses of a size convenient for swallowing**; that is to say, not larger than 0,5 Gm. nor smaller than 0,1 Gm. in weight. If the pill is of a larger size it is called a *bolus* (Latin, *bolus, i*—a mass or lump), the use of which is at present almost entirely restricted to veterinary practice; many people would think it an insult to receive a very large pill. Very small pills are called *granules* (Latin, *granulum, i*), or *parvules;* they range in weight from 0,03 to 0,10 Gm.

The object of giving substances in pill form is to get a definite dose in compact and practically tasteless form. They are deservedly popular. Their disadvantages must, however, not be lost sight of. Their main disadvantage is slowness of solution,

* This is the case, and not the genitive, that is commonly used in prescription-writing.

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hence delay in action, so that substances which are intended to act at once (like emetics, stimulants) should never be prescribed in pill form. Pills are, on the other hand, especially valuable when action upon the intestine is desired. Sometimes pills fail to act on account of insolubility; and it has happened more than once that pills were found in the stools practically unchanged. This is especially liable to occur in case of very old pills, or of compressed pills containing an insoluble substance; hence, such pills should never be prescribed. Another disadvantage of pills is that they must not be prescribed for little children, as it is impossible to make little children swallow pills.

A number of popular pills is official. It will be noted that among the official pills those of cathartic action predominate. The **average dose of the official pills is 2 pills**; excepting pill of opium, pill of phosphorus, and pill of podophyllum, belladonna, and capsicum, of which the average dose is only one pill.

The following are the official pills:

	Composition, each pill:		Dose.
Pilulae aloes,	Purified aloes,	0,13	2 pills
Pills of aloes.	Soap,	0,13	
Pilulae aloes et ferri,	Purified aloes,	0,07	
Pills of aloes and iron.	Excisiccated ferrous sulphate,	0,07	
	Aromatic powder,	0,07	2 pills
Pilulae aloes et mastiches,	Purified aloes,	0,13	
Pills of aloes and mastic.	Mastic,	0,04	
	Red rose,	0,03	2 pills
Pilulae aloes et myrrhae,	Purified aloes,	0,13	
Pills of aloes and myrrh.	Myrrh,	0,06	
	Aromatic powder,	0,04	2 pills
Pilulae asafœtidae,	Asafetida,	0,20	
Pills of asafetida.	Soap,	0,06	2 pills
Pilulae catharticae compositae,	Comp. extr. colocynth,	0,08	
	Mild mercurous chloride,	0,06	
Compound cathartic pills.	Resin of jalap,	0,02	
	Gamboge,	0,015	2 pills
Pilulae catharticae vegetabiles.	Comp. extr. colocynth,	0,06	
	Extract of hyoscyamus,	0,03	

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Pilulae ferri carbonatis, Pills of ferrous carbonate. (Syn. Blaud's pills.)	Granulated ferrous sulphate,	0,16	
	Potassium carbonate,	0,08	
	Sugar,	0,04	
	Tragacanth,	0,01	
	Althaea,	0,01	2 pills
Pilulae ferri iodidi, Pills of ferrous iodide.	Reduced iron,	0,04	
	Iodine,	0,05	
	Glycyrrhiza,	0,04	
	Sugar,	0,04	
	Extract of glycyrrhiza,	0,01	
	Acacia,	0,01	
	Tolu coating,		2 pills
Pilulae laxativae compositae, Compound laxative pills.	Aloin,	0,013	
	Strychnine,	0,0005	
	Extr. of belladonna leaves,	0,008	
	Ipecac,	0,004	
	Glycyrrhiza,	0,046	2 pills
Pilulae opii, Pills of opium.	Powdered opium,	0,065	
	Soap,	0,020	1 pill
Pilulae phosphori, Pills of phosphorus.	Phosphorus,	0,0006	
	Althaea,	0,06	
	Acacia,	0,03	
	Tolu coating,		1 pill
Pilulae podophylli, belladonnae et capsici, Pills of podophyllum, belladonna and capsicum.	Resin of podophyllum,	0,016	
	Extr. of belladonna leaves,	0,008	
	Capsicum,	0,032	
	Sugar of milk,	0,065	
	Acacia,	0,016	1 pill
Pilulae rhei compositae, Compound pills of rhubarb.	Rhubarb,	0,13	
	Purified aloes,	0,10	
	Myrrh,	0,06	
	Oil of peppermint,	0,005	2 pills

In prescribing official pills, the official name of the pill is written in the accusative, as it is the direct object of ℞, (cf. rule, p. 7). Thus, we would prescribe compound cathartic pills as follows:

℞

Pilulas catharticas compositas, V

Sig. One or two pills at bed-time.

For practice in prescription-writing prescribe other official pills.

The method of preparation of pills is best studied practically. Prepare above prescription by following the official formula.

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PILULAE CATHARTICAE COMPOSITAE.

Compound Cathartic Pills.

Compound extract of colocynth,	0,40	Gm.
Mild mercurous chloride,	0,30	Gm.
Resin of Jalap,	0,10	Gm.
Gamboge,	0,075	Gm.
Diluted alcohol, a sufficient quantity to make	5	pills

Mix the powders in a mortar, then add diluted alcohol in very small portions, kneading thoroughly after each addition, until the proper consistence is obtained. The mass should be made to have the consistence of a dough, sufficiently soft to admit of molding, but not so soft as to lose its shape on keeping. If accidentally too much diluted alcohol, which is the excipient in this case, be added, this can be remedied by the addition of some inert powder, such as starch. The mass having been formed by thorough trituration, it is placed on a smooth surface, upon which it is well to place a little dusting powder (lycopodium, or starch) to prevent the mass from sticking to it. The mass is then rolled out by means of a spatula into a cylinder of uniform diameter; and this is cut into five equal parts. These are formed into spherical shape by rolling them between the thumb and the first two fingers. They are then finished by placing the pills with a liberal amount of dusting powder under a pill finisher (the lid of a pill box will serve the purpose), gently rolling the pills by means of it upon a smooth surface. Some of the dusting powder (conspergative) is placed in the pill box together with the pills to keep the latter from sticking. Label with the transcription.

Pill-coating aims to disguise the taste and increase the permanence of pills. The following coatings may be used:

(a) **Gelatin-coating.** This is the most popular and probably the best coating for the great majority of pills; it is best because most easily soluble. It is obtained by dipping pills in a strong warm solution of gelatin, which is then allowed to harden in the air. This process can only be well carried out on a large scale. Hence, ready-made coated pills are frequently prescribed. Gelatin-coating is usually specified by writing after the number of pills, and enclosed in parentheses the initials for gelatin-coated; thus: (g. c.). It is true that this sins against the

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fundamental rule to have the whole of the inscription in Latin; still usage seems to have rendered this the best understood brief designation. A prescription for gelatin-coated vegetable cathartic pills would be written as follows:

℞
Pilulas catharticas vegetabiles, xii, (g. c.)
Sig. One at bed-time.

A gelatin-coating, quite as serviceable if not as elegant, can be given pills by any pharmacist by the use of gelatin capsules, for the prescribing of which see below.

(b) **Sugar-coating** is produced by moistening the pill with mucilage of acacia; then quickly transferring to a porcelain capsule containing a mixture of milk sugar, 8 parts, and powdered acacia, 2 parts; and rapidly rotating until they are covered with a firm white covering. Sugar-coating can only be satisfactorily carried on by the manufacturer; hence in prescribing sugar-coating, we write after the number of pills ordered (s. c.), meaning sugar-coated. If the porcelain capsule in which the pills are shaken contains cacao powder instead of the sugar mixture, cacao-coating is obtained.

(c) **Tolu-coating** is used by the pharmacopœia to protect delicate chemicals, such as ferrous iodide or phosphorus against change on exposure to the air. Such coating is obtained by rapidly rotating the pills in a porcelain capsule containing a little of an ethereal solution of tolu.

(d) **Gold or silver coating,** though now much less frequently employed than formerly, before gelatin or sugar-coated pills were in use, has a distinct field of usefulness for the coating of comparatively small quantities of pills. The coating can be made by the pharmacist by simply shaking the pills, freshly made and still sticky, in a box with gold or silver foil. By this means the pills become loosely coated with bits of broken foil which quite efficiently conceal the taste, and yet give no obstacle to the penetration of solvents. Such coating may be prescribed by writing in the subscription, after the usual formula, the words: *obducantur foliis auri* (abbr., *obduc. fol. auri*) let them be covered with leaves of gold; or *obducantur foliis argenti,* of silver.

(e) **Enteric pills** *(pilulae entericae)* are pills coated with a

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material that is insoluble in the stomach, but soluble in the intestine. Such coatings are: 1. Keratin, made from goose-quill. 2. Salol. 3. Glutoid, gelatin capsules hardened in formalin. These coatings may be used when we desire action upon the intestine alone, when the substance acts unfavorably upon the stomach, or when the medicament is impaired in its action by the gastric secretion. Pills thus coated have, however, the disadvantage that they may not be dissolved in the intestine, and escape the body in the stools without having exerted the action expected of them. A fairly satisfactory substitute for these coatings against which this objection cannot be urged, and which has, furthermore, the advantage that it can be readily prepared by any pharmacist, is enclosing the pill mass in double gelatin capsule, i. e., one gelatin capsule within the other.

In **prescribing extemporaneous pills** it should be borne in mind that a pill mass consists of at least two parts: (1) the basic ingredients, (2) the excipient.

(1) **The basic ingredients.** We may prescribe in pill form almost any solid medicine that is not deliquescent and the dose of which is small (not exceeding 1 to 2 Gm.). Liquids can be prescribed in pill form if the dose of the liquid does not exceed a drop.

A **diluent** is necessary under various circumstances: (a) When the dose of the active ingredient is very small as, e. g., 1 mg. of strychnine sulphate. Here the diluent is necessary to form pills of the proper size. (b) Very irritant or caustic substances require a diluent in order to avoid excessive action on the stomach. (c) If all the ingredients are resinous or extractive in character, as such pills are apt to flatten; the addition of a vegetable powder affording by its fibres and cell walls the mechanical support necessary to maintain the globular shape. One of the best diluents for these purposes is powdered licorice root (glycyrrhizæ pulvis).

(2) **The excipient,** or cohesive, varies with the nature of the basic ingredients. Upon the proper choice of the excipient depend the keeping qualities of the pills, which should be such that the pills will retain their shape, and that they neither harden, nor soften, nor crumble by age. Sometimes the ingredients are rendered sufficiently adhesive by the addition of a few drops of water or of alcohol. Usually an adhesive must be used,

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among which glucose, extract of gentian, glycerite of starch may be mentioned as probably the most generally useful. For chemicals that are destroyed by these organic substances, e. g., silver nitrate, potassium permanganate, the best excipient is petrolatum; and the best diluent is kaolin. For liquids, solid excipients must be used, among which are mentioned bread crumb *(mica panis)*, soap, acacia, starch. The physician should prescribe the excipient, whenever possible, especially when a particular excipient is needed. Commonly, however, the choice of the excipient may be safely left to the pharmacist. When the excipient is specified, a sufficient quantity *(q. s.)* is ordered; leaving the determination of the amount to the compounder.

The simplest subscription being best, provided it is explicit enough, the formula: *misce, divide in pilulas,* abbr. *m., div. in pil.* is to be preferred. The word *misce* implies the making of a mass; otherwise it could not be divided into pills.

For example:

Hematinic tonic.

℞

Arseni trioxidi,	0,06 Gm.
Strychninae sulphatis,	0,06 Gm.
Ferri reducti,	2,00 Gm.

Misce, divide in pilulas XXX.
Sig. One pill three times daily after meals.

Administration of pills. Pills are swallowed down as a whole, generally with the aid of a small quantity of fluid. Never prescribe pills for small children, as they can not be made to swallow them. There are adults who think they can not swallow pills. In these cases the fault lies generally in the patient looking up while attempting to swallow the pill. In this position the swallowing of a bolus of food would be quite as difficult or impossible. The remedy lies in having the patient look down while swallowing; and putting the pill far back upon the tongue.

Sometimes having the pill packed in a small piece of moistened wafer paper, or mixed with a little gruel seems to help in deglutition. A method that is said to succeed when others fail is to dig out the seeds of a dark skinned grape and place the pill instead, and then give the grape to be eaten by popping the pulp into the mouth and swallowing at once without chewing.

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Practice in Prescription-Writing.

PROBLEM 77. For dropsy. Prescribe 20 pills; each to contain: mass of mercury, powdered digitalis, powdered squill, of each 0,05 Gm. One three times daily.

PROBLEM 78. For gastric catarrh. 30 pills; each pill to contain: silver nitrate; 0,01 Gm.; Kaolin, 0,1; petrolatum, as excipient. One three times a day half hour before meals.

PROBLEM 79. Drastic cathartic. Croton oil 1 drop to be divided into eight pills, with bread crumb as excipient. One pill every 15 minutes until desired effect is obtained.

PROBLEM 80. Stimulant. Prescribe 30 pills of strychnine sulphate, 1 mg. using enough powdered glycyrrhiza to make pills of proper size. One every four hours.

CLASS 2. TROCHISCI. TROCHES.

(Lozenges.)

NOM.—*Trochiscus;* acc. *trochiscos;* abb., *troch.;* gender, male.

PRONUNCIATION.—Tro-kis'-kus. Eng. trōk or tro'-ke.

Derivation of term from Gr. *trochiskos,* a little wheel.

DEFINITION.—**Small, dry, solid masses, usually of flattened shape, intended to be dissolved in the mouth like candies.** They range in weight from 0,3 to 1,5 Gm. Troches may be considered the dosage form of confections.

They are intended chiefly to serve for mouth and throat medication, as they afford a prolonged surface contact with the oral and pharyngeal mucous membrane, although some are used for their effect after being swallowed. Obviously, lozenges should not be made of substances having a very disagreeable taste. They are usually mildly medicated. Their dose is one, repeated as necessary.

They are prepared by kneading the active substance, sugar, mucilage and flavoring into a mass, a confection, which is then

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	Composition, each:	Gm.
Trochisci acidi tannici,	Tannic acid,	0,06
Troches of tannic acid.	Sugar, in fine powder,	0,65
	Tragacanth, in fine powder,	0,02
	Stronger orange flower water, sufficient.	
Trochisci ammonii chloridi,	Ammonium chloride,	0,10
Troches of ammonium chloride.	Extract of glycyrrhiza,	0,20
	Tragacanth,	0,02
	Sugar,	0,40
	Syrup of tolu, a sufficient quantity.	
Trochisci cubebae,	Oleoresin of cubeb,	0,02
Troches of cubeb.	Oil of sassafras,	0,01
	Extract of glycyrrhiza,	0,25
	Acacia,	0,12
	Syrup of tolu, a sufficient quantity.	
Trochisci gambir,	Gambir,	0,06
Troches of gambir.	Sugar,	0,65
	Tragacanth,	0,02
	Stronger orange flower water, sufficient.	
Trochisci glycyrrhizae et opii,	Extract of Glycyrrhiza,	0,15
	Powdered opium,	0,005
Troches of glycyrrhiza and opium.	Acacia,	0,12
	Sugar,	0,20
	Oil of anise,	0,002
	Water, a sufficient quantity.	
Trochisci krameriae,	Extract of krameria,	0,06
Troches of krameria.	Sugar.	0,65
	Tragacanth,	0,02
	Stronger orange flower water, sufficient.	
Trochisci potassii chloratis,	Potassium chlorate,	0,15
Troches of potassium chlorate.	Sugar,	0,60
	Tragacanth,	0,03
	Water, a sufficient quantity.	
Trochisci santonini,	Santonin,	0,03
Troches of santonin.	Sugar,	0,90
	Tragacanth,	0,03
	Stronger orange flower water, sufficient.	
Trochisci sodii bicarbonatis,	Sodium bicarbonate,	0,18
Troches of sodium bicarbonate.	Sugar,	0,54
	Nutmeg,	0,01
	Mucilage of tragacanth, sufficient.	

In prescribing official troches, the name is written in the accusative case, because it is the direct object of recipe; thus:

Worm lozenges.

℞

Trochiscos santonini, **iv**

Sig. Two night and morning.

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Prescribe other official troches.

Troches are rarely prescribed to be made extemporaneously; because they cannot be made in less than two or three hours, on account of the drying necessary. If occasion should arise for prescribing them, the ingredients would be: (1) the medicament, (2) sugar, (3) flavoring, if necessary, (4) excipient, which may be mucilage of tragacanth, or powdered tragacanth and water, or acacia as in the official formulae. The subscription would be: *misce, divide in trochiscos*——*; (abbr. *m., div. in troch.*——*); mix, divide into ——— troches. For example:

℞ For gout.

Guaiaci,	1,20 Gm.
Sacchari pulveris,	12,00 Gm.
Tragacanthae pulveris,	0,40 Gm.
Aquae aurantii florum fortioris,	q.s.

Misce, divide in trochiscos XX.
Sig. Dissolve one on the tongue every two hours.

Practice in Prescription-Writing.

PROBLEM 81. Laxative lozenges. Prescribe lozenges containing compound powder of glycyrrhiza, 0,6 Gm. each. One to three to be taken at bed-time.

CLASS 3. TABELLAE. TABLETS.

NOM.—*Tabella;* gen. *tabellae;* abbr., *tab.;* gender, female.
PRONUNCIATION.—Ta-bel'-ah.

Derivation of the word is from Lat. *tabula,* a table, a plate; *tabella* being the diminutive, meaning a small plate.

DEFINITION.—**Small disc-shaped bodies containing medicament.**

Tablets may be dissolved in water before use; or they may be swallowed as a whole.

We must distinguish between the following kinds of tablets. Subclass a. Compressed tablets, which are pure medicinal matter obtained in disc-shape by compression. Subclass b. Tablet

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without the use of compression or of adhesive substance. Subclass c. Tablet saturates. Subclass d. Hypodermic tablets.

Subclass a. **Compressed tablets** usually differ from tablet triturates not only in containing pure medicament without diluent; and in being made by compression machines; but also in shape, having oval instead of flat faces. They are made from granulated materials, and not from fine powders; which accounts for the mottled appearance of compressed tablets containing mixtures. A matter of the greatest possible importance is the rate of disintegration of the tablet. Unless the tablet is to be used as a lozenge, speedy disintegration must be secured; or else the tablet may pass through the alimentary tract, not only without exerting its medicinal action; but actually capable of doing harm by the irritation which the hard body may produce in the intestine. Hence compressed tablets are best suited for the administration of readily soluble salts, such as ammonium chloride. Slowly soluble bodies, such as quinine sulphate, or insoluble substances, such as charcoal, should not be administered in this form, unless the tablet is known, by actual demonstration, to disintegrate rapidly. Light pressure and the admixture of some inert soluble body may suffice to secure rapid disintegration. The addition of a very small quantity of sodium bicarbonate and tartaric acid, not enough to cause effervescence, may be used to force the tablet apart. The addition of a slight trace of petrolatum is also useful in preventing the drug from packing too firmly together.

On the whole, though most popular because of ease of manufacture, the compressed tablet is the least desirable.

Subclass b. **The tablet triturate** *(tabella trituratio)* possseses advantages over compressed tablets, indeed over any other method of administering solid substances. Well made tablet triturates disintegrate immediately on being placed in water; thus they have the same degree of solubility as powders, over which they have the advantage of being taken much more readily and conveniently. They are more soluble than capsules, pills, and compressed tablets. They are prepared by triturating the medicament with sugar or sugar of milk, and then moistening the powder with sufficient alcohol to make a paste. The moistened powder is pressed into molds consisting of a plate perforated with holes of the desired size of the tablet; and then pressing

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out the tablets by fitting this perforated plate over another plate, upon which are situated pegs that accurately fit the perforations. When the alcohol evaporates, which requires but a few minutes, the tablets retain their shape and are ready for use. It will be noted that the essential difference between tablet triturates and pills is that the former are made without adhesive.

Tablet triturates weigh about 0,05 Gm. each; hence they are only suitable for the administration of medicines the dose of which is small, such as calomel, morphine sulphate, aconitine, arsenic. There are no official tablets. When tablet trituates are prescribed, it is customary to designate the quantity of medicament wanted in each tablet; and then to order the pharmacist to dispense the desired number, as in the following example:

℞ Alterative

Arseni trioxidi, 0,001 Gm.
Sacchari lactis,* q. s.
Fiat tabella trituratio; mitte tales XXX.
Sig. One three times a day after meals.

Subclass c. **The tablet saturate** *(tabella saturatio)* is a sugar tablet, originally made without medication (so-called blank tablet); which is medicated by the addition of a drop of alcoholic solution of a powerful medicine. The alcohol is then allowed to evaporate. Tablet saturates are prescribed as follows:

℞

Tincturae aconiti, gtt. i.
Fiat tabella saturatio; mitte tales iv.
Sig. One every hour.

Prepare above prescription from blank tablets.

Practice in Prescription-Writing.

PROBLEM 82.—Purgative. Order 10 tablets of mild mercurous chloride, 0,006 Gm. in each, with sodium bicarbonate as diluent. One to be taken every hour.

PROBLEM 83. Hypnotic. Twenty tablets of hyoscine hydrobromide, 1/2 mg. each. One to be taken at bedtime.

* It is not absolutely necessary to mention the diluent, unless another diluent than sugar of milk is to be used.

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PROBLEM 84. Heart tonic. Prescribe tablet saturates, each of which is to contain 1 drop of fluidextract of digitalis. Two to be taken every three hours.

Subclass d. **Hypodermic tablets** *(tabellae hypodermicae)* are intended to be dissolved in sterile water to furnish extemporaneous solutions for hypodermic use. They are prepared either as tablet triturates or as compressed tablets with the following special points in view. The least irritating diluent must be used; dried neutral sodium sulphate seems best. The tablet must be readily soluble in 1 Cc. of water, the average capacity of hypodermic syringes. The material must be sterile; and the utmost precautions of asepsis must be used in the preparation and the packing of the tablets, so as to be sure that they are free from pathogenic microorganisms. Convenience, permanence, and accuracy in weight have caused these tablets to come into universal use.

In giving a hypodermic injection with the use of these tablets the following steps may be distinguished:

1. Sterilization. Sterilize a little water by boiling for a few minutes. (This may be conveniently done in a tablespoon over any kind of flame.) Cleanse the syringe by filling it several times with a 5 per cent. solution of carbolic acid. Cleanse needle, after having removed its wire, by dropping it in alcohol.

2. Filling of Syringe. Draw up into the syringe some sterile water. Then drop in the hypodermic tablet, avoiding contact of the latter with anything that is not clean. Remove the needle from the alcohol, and screw it on the barrel, avoiding contact of the part that is to be introduced beneath the skin with anything that is not sterile *(e. g.,* fingers.)

3. "Starting" of the Syringe. Hold the point of the needle upward and gently push on the piston until the first drop of fluid escapes. This is done in order to expel the air, which it is always undesirable to inject. Set the syringe aside so that its point will remain clean; if it touches anything not sterile it must be wiped with alcohol.

4. Cleansing of Skin with alcohol (usually sufficient); better still, with 5 per cent. solution of carbolic acid, followed by alcohol. If the part be dirty, preliminary cleansing with soap and water is necessary.

5. Insertion of needle into the loose connective tissue beneath

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the skin, with a swift stroke. It is probably best to pinch up the skin of the part with thumb and forefinger. The needle is sent well into this fold, introducing it preferably above the finger and thumb, so that the pressure of the fingers may lessen the pain and hold the part steady.

6. Inject slowly. Hold the syringe steady, and slowly and gently push down the piston, so that the minimum of damage be done to the delicate tissue binding the skin to the parts below.

7. Withdraw swiftly. Gentle rubbing of the part toward the center of circulation helps in absorption and may be resorted to when absorption is presumably poor. The little puncture needs no after-care.

8. After-care of the syringe is of importance, or else the little instrument will soon be out of order. Unscrew the needle, drop it in strong alcohol, push a fine wire through it and *always keep the needle wired* when not is use. The syringe is rinsed in sterile water, or carbolic acid solution (not in alcohol unless the piston is all metal or glass); and its cap is screwed on tightly. Each student should practice the administration of hypodermic injections.

CLASS 4. CAPSULAE. CAPSULES.

NOM.—*Capsula;* gen., *capsulae;* abbr., *caps.;* gender, female.

PRONUNCIATION.—Kap'-su-lah.

Derivation of the word. It is the diminutive of Lat.*capsa*, a chest, meaning a little box.

DEFINITION.—**A shell of soluble material used for disguising the taste of medicinal substances enclosed in them.**

We may recognize two subclasses: subclass a. gelatin capsules; subclass b. starch capsules.

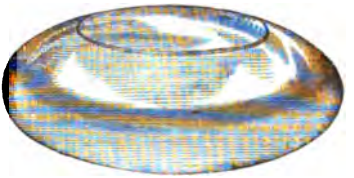
Subclass a. **Gelatin capsules** *(capsulae gelatinæ)*, invented by Mothes, a French pharmacist, in 1833, are shells made of gelatin. There are two varieties: the hard and the soft, the latter being

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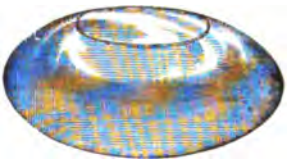
ministered in gelatin capsules, if the capsule is taken within a few minutes after filling.

Empty gelatin capsules, as well as filled capsules are put upon the market by manufacturers. Rather large doses of oily liquids, such as castor oil or cod liver oil, are best obtained in elastic capsules from manufacturers; for the reason that soft capsules are more easily swallowed than hard capsules, and that the manufacturer has the best facilities for producing elegant soft capsules. The accompanying illustration shows the shape and sizes of Parke, Davis and Company's capsules. Soft capsules up to the size of 5 Gm. can be readily swallowed by most persons.

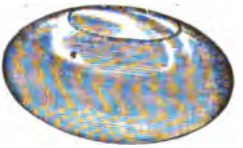
ELASTIC FILLED CAPSULES.



15 Gm. Size.



10 Gm. Size.



5 Gm. Size.



2,5 Gm. Size.



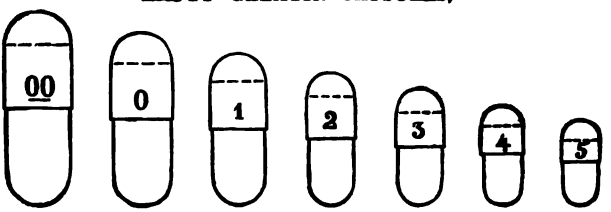
0,6 Gm. Size.

Empty gelatin capsules may be used for dispensing of powders, masses, or liquids. They range in size from 00 to 5. Size 00 has capacity for about 0,5 Gm. of quinine sulphate or similar light substance, while it would hold 1,3 Gm. of as heavy a substance as bismuth subnitrate. Size 5 will hold about 0,05 Gm. of quinine sulphate.

For **the dispensing of powders,** capsules are exceedingly useful; especially for ill tasting powders, and for sparingly soluble substances that may have a tendency to form insoluble masses with excipients. When it is desired to direct the druggist to dispense a powder in this form, the subscription would be: *Fiat pulvis et divide in capsulas* (abbr. *Ft. pulv. et div. in caps.*———), meaning let a powder be made and divide it into ——— capsules.

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EMPTY GELATIN CAPSULES.



Prepare

℞ Antimalarial.

Quininae sulphatis,	1,0 Gm.
Capsici pulveris,	0,1 Gm.

Misce, fiat pulvis et divide in capsulas iv.
Sig. One every four hours.

Mix the powders in a mortar, divide them into four equal parts, and fill the capsules with the aid of the spatula. Preserve them in a pill box, and label.

Should it be desired to put a **pill mass in capsules**, the subscription is: *Misce, fiat massa, divide in capsulas* —— (abbr. *M. ft. massa, div. in caps.* ——). Meaning: mix, let a mass be made, divide into ——— capsules.

Prepare

℞ Sedative Nervine.

Camphorae pulveris,	0,36 Gm.
Extracti hyoscyami,	0,18 Gm.
Extracti sumbul,	0,75 Gm.

Misce, fiat massa, divide in capsulas vi.
Sig. One every half hour for three doses, then every two hours.

Having formed the mass, and divided it into six parts, mold each part into a little cylinder that will fit a capsule of the proper size.

Oily or resinous liquids when given in rather small doses,

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Fill the shell of the capsules by means of a measuring pipette, taking care that no portion of the Copaiba touches the exterior of the shell. The caps, which had just previously been set for a few minutes on filter paper saturated with water, are now put on; the capsule being kept in an upright position for a few minutes, when a perfectly hermetic seal will have been obtained.

Subclass b. **Starch capsules,** *(Capsulae amylaceae)*; also known as cachets *(Cachetae)*, wafers, or koseals, are two little disks of dried paste resembling in shape little soup plates, which are made to enclose powder placed in the hollow of the two by moistening their edges and pressing them together, so that the edges adhere. They were invented by Limousin of Paris, about 1870. Previous to this time wafers were used to facilitate the swallowing of powders by moistening a circular wafer sheet, placing the powder in the center, and folding over the edges so as to form "a sort of an oyster" which can be swallowed easily by, floating it in a spoon with a little water. Now, however, we usually make the pharmacist put on the little wrapper.

By means of these starch capsules, we are enabled to give larger quantities of powders at one dose than we can by means of gelatin capsules. Cachets will hold from 1 to 2 Gm. of powder.

Starch capsules are probably best prescribed at present by the name *cacheta*, so that the subscription would be: *divide in cachetas*———, divide into ——— cachets; or *pone in cachetam unam*, place in one cachet.

Prepare

℞ For gastric flatulence.
Carbonis ligni, 4,0 Gm.
Divide in cachetas iv.
Sig. One as needed after meals.

Fill the concavity of one wafer with the powder; then fit to the margin another wafer, the margin of which has previously been moistened. By firm pressure on the margins the two wafers are made to adhere tightly, and hold between their concavities the powdered drug.

Administration of capsules. Cachets or capsules are dropped in a spoonful of water, milk, coffee, or other fluid. When the

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entire surface has been moistened and softened, which takes only a few moments, the spoon is placed far back upon the tongue, and the capsule is swallowed at one gulp without breaking it. These directions should be given explicitly to patients, especially in case of cachets; for it has happened that patients have opened the capsule or cachet, or have chewed it; in either case, of course, defeating the object of this form of administration. Needless to say we cannot give capsules to infants, nor cachets to children.

Practice in Prescription-Writing.

PROBLEM 85. Prescribe 12 elastic capsules, each to contain 5 Cc. of cod liver oil. One to be taken one hour after meals.

PROBLEM 86. Chronic gonorrhea. Prescribe 60 capsules, each to contain copaiba, 0,25 Cc.; powdered cubeb, 0,50 Gm.; with enough spirit of peppermint to form a mass. Three to be taken three times daily after meals.

PROBLEM 87. Hypnotic. 0,5 Gm. capsules of sulphonmethane in powder form. One or two to be taken at bedtime.

PROBLEM 88. Intestinal antiseptic. Bismuth subsalicylate and betanaphthol, of each 0,5 Gm. To be dispensed in cachets. One to be taken two hours after meals.

CLASS 5. SUPPOSITORIA. SUPPOSITORIES.

NOM.—*Suppositorium;* gen., *suppositorii;* abbr. *suppos.;* gender, neuter.

PRONUNCIATION.—Lat. Su-poz-it-o'-re-um. Eng. Sup-oz'-it-o-re.

DERIVATION.—From Lat. *supponere*, to place under.

DEFINITION.—**Suppositories are suitably shaped medicated solids intended for introduction into the various passages of the body.** Their consistence is such that, while they retain their shape at ordinary room temperature, they will readily melt at the temperature of the body.

They serve the purpose of injections, over which they have the advantage of greater comfort and cleanliness, as well as being more easily introduced, and producing more prolonged contact.

The size and shape of a suppository should be such as to enter

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easily the orifice for which it is intended. The shape conforms more or less to that of a rifle bullet.

Rectal suppositories, also simply called suppositories (*suppositoria),* should be cone-shaped or spindle shaped, and usually weigh about 2 Gm. Of course, suppositories for children are made smaller.

Vaginal suppositories, also known as medicated pessaries, (Lat. *pessarium, -ii* or *pessum, -i;* gender n.), should be globular or oviform in shape, and weigh about 4 Gm.

Urethral suppositories, also known as medicated bougies, (Lat. *bougia, -ae;* gender f.) should be pencil-shaped, pointed at one end. They are made in two lengths; either 7 Cm., weighing 1 Gm., or 14 Cm. long, weighing 2 Gm.

Nasal suppositories *(suppositoria nasalia),* are pencil shaped have about the length of short urethral suppositories, weighing 1 Gm. **Aural suppositories** are cartridge shaped, and weigh 0,5 Gm.

The most generally useful vehicle for suppositories is oil of theobroma (Oleum theobromatis, Syn. Cacao butter), whose melting point is about 93°F., which is just a little lower than the normal temperature of the human body (98.6°F.) Glycerinated gelatin (Gelatinum glycerinatum) is sometimes used, especially for urethral suppositories, for which cacao butter is too brittle. On the other hand, glycerinated gelatin is less suitable for vaginal suppositories, as it may mat the pubic hair. Suppositories made with glycerinated gelatin weigh about twice as much as those made with oil of theobroma. A third vehicle for suppositories is sodium stearate, a very hard soap, by means of which it is possible to give to 90% of glycerin the required consistency; it is used in the preparation of the only official suppository: *Suppositoria glycerini* (Suppositories of glycerin), each of which contain 3 Gm. of glycerin.

The prescribing of suppositories is very simple. Write the names and quantities of the active ingredients, and add enough of oil of theobroma, to make the total mass weigh as many grams as desired. Unless a special size of suppository is wanted, it will suffice to prescribe *q. s.* of oil of theobroma. The subscription is: *misce et divide in suppositoria*——*; meaning: mix and divide into——— suppositories.

*Number in Roman numerals.

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For suppositories made with glycerinated gelatin, the following formula may be used:

The medicinal ingredient, the quantity desired;
Water,
Glycerin,
Glycerinated gelatin, each a sufficient quantity.

The pharmacist will then use a little water, and enough glycerin to make the weight of the mixture one-half that of the finished mass; and then thoroughly incorporate it with an equal weight of melted glycerinated gelatin, and pour it at once into suitable molds which have been greased with a small quantity of petrolatum. The mold should be thoroughly cooled before removing the suppositories.

For the preparation of cacao butter suppositories, two processes are available; known respectively as the "hot process" and the "cold process." The hot process consists in melting the oil of theobroma; mixing it with the medicament; and pouring the mixture, just as it begins to congeal, into well-cooled molds. The cold process may be illustrated by the following practical example.

Prepare

℞

Extracti opii,	0,12 Gm.
Extracti belladonnae foliorum,	0,04 Gm.
Olei theobromatis, q. s. ad	8,00 Gm.

Misce et divide in suppositoria iv.
Sig. Use one at bed-time.

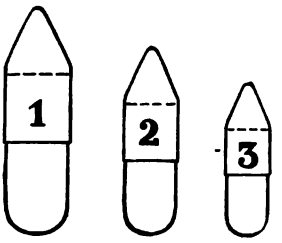
Rub down the extracts in a mortar with a minute quantity of water to make a smooth soft paste. Grate or shave the oil of theobroma into small particles. Add about an equal weight of the grated oil of theobroma to the extracts in the mortar, mix thoroughly, and incorporate the remainder of the oil of theobroma, working the mixture actively with the pestle until the mass is homogeneous and plastic like a pill mass, adding if necessary a small quantity of expressed oil of almond. Then roll the mass into a cylinder, at first in the palm of the hand, and then on a smooth hard surface. Cut the cylinder into the required number of equal parts. Finally, one end is pointed by gently pressing it into shape with the thumb and finger. Lyco-

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podium is used here as a conspergative in the same way as in making pills. If during the process of preparation, the mass becomes brittle and begins to break, plasticity may be restored to it by working it in the hand; if, however, it is handled too much, the mass will begin to melt. Dispense the suppositories in a pasteboard box with appropriate labelling.

Suppository capsules made of oil of theobroma or of gelatin are upon the market. They are filled like other capsules. While they are less troublesome to prepare, they are less desirable than suppositories prepared in the regular way, as the medicament is not incorporated throughout the mass; hence the action is less uniform.

SUPPOSITORY CAPSULES.



Administration. Suppositories should be kept in a cool place until they are used. Glycerinated gelatin suppositories must furthermore be protected against dryness as well as moisture by keeping them in a tightly closed container. Give careful verbal instructions, especially in regard to the place of introduction; while the written directions usually indicate merely the frequency of using, as in above prescription.

Practice in Prescription-Writing.

PROBLEM 89. Laxative. Prescribe 1 dozen of glycerin suppositories; one to be used every morning.

PROBLEM 90. Hemorrhoids. 15 tannic acid (0,20 Gm.) and opium (0,05 Gm.) suppositories. One every three hours.

PROBLEM 91. Antiseptic astringent. Prescribe 10 silver nitrate pessaries, each containing 0,06 Gm. of the salt. One to be used locally three times a day.

PROBLEM 92. Urethritis. Prescribe 6 urethral suppositories, each to contain 0,015 Gm. of zinc sulphate. One to be used locally on retiring.

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ORDER IV. EXTERNAL PREPARATIONS.

Division 1. Liquid.
- Class 1. Lotions.
- Class 2. Liniments.
- Class 3. Oleates.
- Class 4. Collodions.
- Class 5. Pigments.

Division 2. Semi-solid.
- Class 1. Ointments.
- Class 2. Cerates.
- Class 3. Poultices.

Division 3. Solid.
- Class 1. Plasters.
- Class 2. Papers.
- Class 3. Dusting Powders.

DIVISION I. LIQUID EXTERNAL PREPARATIONS.

CLASS 1. LOTIONES. LOTIONS.

(Washes.)

NOM.—*Lotio;* gen., *lotionis;* gender, female.

PRONUNCIATION.—Lo'-she-o; gen., lo-she-o'-nis.

ORIGIN OF NAME.—The term is Latin, meaning a wash.

DEFINITION.— **An aqueous solution intended for local application without rubbing.**

Varieties of lotions. When a lotion is to be applied to the general body surface, it is known as a **bath,** (Lat. *balneum, -i*). A wash for the eyes is popularly known as **eye water,** or "eye drops," (Lat. *collyrium, -i*). A wash for the throat is called a **gargle,** (Lat. *gargarisma, -atis*). When a lotion is to be introduced into the passages of the body by means of a syringe, it is called an **injection** (Lat. *injectio, -onis*). A rectal injection is also known as an **enema** (Lat. *enema, -atis*), clyster, or lavement.

There are no official lotions; but the National Formulary con-

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tains formulæ for a few very popular applications of this kind, with which the student should be familiar.

	Composition.	Gm. or Cc.
Lotio flava, N. F.,* Yellow lotion. (Syn. Yellow wash.)	Corrosive mercuric chloride,	0,30
	Lime water,	100,00
Lotio nigra, N. F.,* Black lotion. (Syn. Black wash.)	Mild mercurous chloride,	0,75
	Lime water,	100,00
Lotio plumbi et opii, N. F.* Lotion of lead and opium. (Syn. Lead and opium wash.)	Lead acetate,	1,75
	Tincture of opium,	3,50
	Water, enough for	100,00

In **prescribing extemporaneous lotions,** it must be remembered that the percentage of active ingredients present is equivalent to dosage of internal medicine. Hence it is of the utmost importance to adjust the concentration to the sensitiveness of the surface for which the application is intended. Obviously the delicate mucous membrane of the eye will need a much more dilute lotion than the resistant mucosa of mouth and throat. When a large amount of fluid is required, as in baths, rectal, or vaginal injections, the active ingredients may be ordered of the druggist, either in form of powder or of concentrated solution, which is to be added by the patient to the specified quantity of water. The subscription in case of lotions would be: *misce, fiat lotio;* mix, let a lotion be made. The transcription should indicate clearly that the remedy is intended for external use; e. g., "Not to be taken," or "For external use only."

Practice in Prescription-Writing.

PROBLEM 94. Deodorant lotion. To destroy foul odor of mouth, axilla, or feet. Potassium permanganate, 1 to 60 of distilled water. Apply frequently.

PROBLEM 95. Lotion in acute eczema, characterized by great heat, redness, and discharge. Solution of lead subacetate, 2 parts; glycerin, 1 part; bitter almond water, 7 parts.

* In each of these lotions a precipitate is formed, which would constitute a chemical incompatibility, were it not intended by the prescriber.

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PROBLEM 96. Lotion for iritis. Prescribe 15 Cc. of solution containing atropine sulphate, ½%; zinc sulphate, ½%; in distilled water. Two drops in eye three times a day.

PROBLEM 97. Dobell's solution; for nasal douche. Sodium borate, and sodium bicarbonate, of each 1,5%; carbolic acid, 0,3%; glycerin, 3,5%; water, as vehicle. Directions: Dilute with equal quantity of warm water; and use as nasal douche. This solution may be obtained by prescribing: *Liquor sodii boratis compositus, N. F.*

CLASS 2. LINIMENTA. LINIMENTS.

(Embrocations.)

NOM.—*Linimentum;* gen., *linimenti;* abbr., *lin.;* gender, neuter.

PRONUNCIATION.—Lat. lin-im-en'-tum. Eng. lin'-im-ent.

ORIGIN OF NAME FROM Lat., *linere*, smear.

DEFINITION.—**Liniments are liquid preparations intended for inunction.** They are oily, soapy, or alcoholic liquids, as they are designed to penetrate the fatty surface of the skin, which aqueous liquids fail to do.

A number of excellent liniments is official, as will be seen from the following list:

	Composition.	Gm. or Cc.
Linimentum ammoniae,	Ammonia water,	35,00
Ammonia liniment.	Alcohol,	5,00
(Syn. Volatile liniment.)	Cotton seed oil,	57,00
	Oleic acid,	3,00
Linimentum belladonnae,	Camphor,	5,00
Belladonna liniment.	Fluidextract of belladonna root, to make	100,00
Linimentum calcis,	Lime water,	50,00
Lime liniment. (Syn. Carron oil.)	Linseed oil,	50,00
Linimentum camphorae,	Camphor,	20,00
Camphor liniment.	Cotton seed oil,	80,00
Linimentum chloroformi	Chloroform	20,00

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Linimentum saponis mollis,	Soft soap,	65,00
Liniment of soft soap.	Oil of lavender flowers	2,00
	Alcohol, to make	100,00
Linimentum terebinthinae,	Resin cerate,	65,00
Turpentine liniment.	Oil of turpentine,	35,00

Prepare as example:

LINIMENTUM TEREBINTHINAE.

Turpentine Liniment.

Resin cerate,	19,5 Gm.
Oil of turpentine,	10,5 Cc.
To make	30,0 Cc.

Dissolve the resin cerate, previously melted in a dish on the water-bath, in the oil of turpentine, and mix them thoroughly. Preserve in a bottle, and label with official name.

In **prescribing an extemporaneous liniment,** it should be borne in mind that the presence of a fatty or soapy substance is desirable, in order to give it "body" for inunction, a function performed, for instance, by the resin cerate in the official turpentine liniment. The official soap liniment in which soap furnishes the "body" may be used as the vehicle for extemporaneous liniments. In prescribing compound liniments, the subscription would be: *misce et fiat linimentum;* mix and let a liniment be made.

Administration. Liniments should be plainly marked "For external use only"; for many of them would be poisonous if taken internally. For this reason it is desirable that they be dispensed in bottles that can be distinguished by the touch from those in which internal medicines are put. The patient should receive careful instructions in regard to the amount of friction (massage) desired; it may have to be very gentle, or quite energetic; indeed it is often the massage that is mainly desired, as many a patient may be induced to rub and knead a joint for half an hour with a liniment when he would not do so with his hands

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Practice in Prescription-Writing.

PROBLEM 98. Counterirritant liniment in bronchitis. Write prescription for 120 Cc. of turpentine liniment with 10% of tincture of iodine. To be applied with friction.

PROBLEM 99. A. B. C.* liniment, a popular anodyne application. Tincture of aconite, liniment of belladonna, chloroform, of each 30,0 Cc.; soap liniment, enough for 240,0 Cc. Directions: Apply with friction morning and evening.

CLASS 3. OLEATA. OLEATES.

NOM.—*Oleatum;* gen., *oleati;* gender, female.

PRONUNCIATION.—Lat. o-le-a'-tum. Eng. o'-le-āt.

ORIGIN OF NAME.—From Lat. *oleum,* oil. While the *ate* ending might be taken to indicate that we have to deal with pure chemical compounds, this is not the case; as will be seen from the definition.

DEFINITION.— **Oleates are solutions of bases in oleic acid.** They consist of the compound of the base with oleic acid (the true oleate), dissolved in a large excess of oleic acid.

Oleates are intended to be applied by inunction. They are supposed to possess the advantage over ointments or liniments of being more readily absorbed; they are certainly much cleaner and more elegant than ointments. They have, however, the disadvantage of being more irritating than the latter.

The following oleates are official:

	Composition.	Gm.
Oleatum atropinae, Oleate of atropine.	Atropine,	2,00
	Oleic acid,	50,00
	Olive oil, to make	100,00
Oleatum cocainae, Oleate of cocaine.	Cocaine,	5,00
	Oleic acid,	50,00
	Olive oil, to make	100,00
Oleatum hydrargvri, Oleate of mercury.	Yellow mercuric oxide,	25,00
	Oleic acid, to make	100,00
Oleatum quininae, Oleate of quinine.	Quinine,	25,00
	Oleic acid,	75,00

* Named on account of its active ingredients: aconite, belladonna, and chloroform.

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Oleatum veratrinae, Oleate of veratrine.	Veratrine,	2,00
	Oleic acid,	50,00
	Olive oil, to make	100,00

CLASS 4. COLLODIA. COLLODIONS.

NOM.—*Collodium;* gen., *collodii;* gender, neuter.

PRONUNCIATION.—Kol-o'-de-um.

ORIGIN OF NAME.—From Gr. *collodes,* glue-like, which in turn is derived from *colla,* glue.

DEFINITION.—**Solutions of pyroxylin in a mixture of ether (3 parts) and alcohol (1 part).** When this solution is painted on a surface exposed to the air, the alcohol and ether evaporate, leaving a thin film.

These preparations are intended to furnish a water-proof film, which may be used to cover skin surfaces that are devoid of their natural covering; they may also serve for the prolonged application of medicament to the skin.

The following collodions are official:

	Composition.	Gm.
Collodium, Collodion.	Pyroxylin,	4,00
	Ether,	75,00
	Alcohol,	25,00
Collodium cantharidatum, Cantharidal collodion. (Syn. Blistering collodion.)	Cantharides,	60,00
	Flexible collodion,	85,00
	Chloroform, to extract cantharides, and make	100,00
Collodium flexile. Flexible collodion.	Collodion,	92,00
	Canada turpentine,	5,00
	Castor oil,	3,00
Collodium stypticum, Styptic collodion.	Tannic acid,	20,00
	Alcohol,	5,00
	Ether,	25,00
	Collodion, to make	100,00

We would also call attention to a very popular collodion of the National Formulary.

Collodium salicylatum compositum, N. F., Compound salicylated collodion (Syn. Corn collodion).	Salicylic acid,	11,00
	Extract of cannabis indica,	2,00
	Alcohol,	10,00
	Flexible collodion, to make	100,00

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Collodion (which is contractile) or flexible collodion (which is not) may be medicated with any agent that is soluble in the ether-alcohol mixture. An important exception to this is phenol, which must not be added to collodion, as it causes gelatinization of the latter. Water, added to collodion, separates the pyroxylin.

Caution: Do not handle collodion near an open flame or fire, as it is highly inflammable.

Practice in Prescription-Writing.

PROBLEM 100. Antiseptic wound protectant. Flexible collodion with 5% of iodoform. Directions: Apply to part.

PROBLEM 101. Prescribe compound salicylated collodion of the National Formulary to be applied to corn morning and evening.

CLASS 5. PIGMENTA. PIGMENTS.

NOM.—*Pigmentum;* gen., *pigmenti;* gender, neuter.

PRONUNCIATION.—Pig-men'-tum.

ORIGIN OF NAME.—From Lat. *pingere,* to paint.

DEFINITION.—**Preparations intended to be painted on,** that do not come under the head of collodions. They are usually concentrated and highly active local applications intended for skin or mucous membranes.

Practice in Prescription-Writing.

PROBLEM 102. Stimulant pigment in chronic eczema. Prescribe equal parts of soft soap, oil of cade, and alcohol; with directions that the mixture be painted over the affected region.

PROBLEM 103. Anodyne pigment. Menthol, 8,0; camphor, 45,0; chloral, 45,0; alcohol, enough to make 120,0 Cc. Give directions to paint over painful area.

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DIVISION 2. SEMI-SOLID EXTERNAL PREPARATIONS.

CLASS 1. UNGUENTA. OINTMENTS.

NOM.—*Unguentum;* gen., *unguenti;* abbr., *ung.*, gender, neuter.

PRONUNCIATION.—Lat. ung-gwen'-tum.

ORIGIN OF NAME.—From Lat. *unguo*, annoint.

DEFINITION.—**Fatty preparations of such a consistency as to be easily applicable to the skin by inunction, gradually liquefying when in contact with it.** They usually have the consistency of butter.

Ointments consist of (1) active ingredients and (2) base, which latter should rather be called vehicle, as it serves as carrier, diluent or solvent; we shall, however, make use of the term base, as it is the one most generally employed. As ointments must be perfectly smooth the active ingredient should if possible be dissolved; if the active agent is soluble in fat the ointment should be prepared by fusion; if insoluble in fat but soluble in water, alcohol, or glycerin, the smallest quantity of the solvent should be used, the solution being then thoroughly incorporated with the ointment basis. When the ingredients are insoluble, they must be in fine state of subdivision and mixed with the basis by thorough rubbing in a mortar or preferably with a spatula on a glass slab.

The three principal ointment bases—petrolatum, wool-fat and lard—should be chosen with regard to their following characteristics:

Petrolatum (Lat. *petrolatum, -i*) is the most unchangeable of the three, being unaffected by air, moisture, or chemicals. It is but very slightly absorbed, and does not favor absorption of medicament mixed with it. It does not mix with more than 5 per cent of water. Hence it is not suitable if a considerable quantity of aqueous liquid is to be incorporated with the ointment basis; nor should it be used if absorption is aimed at. If, however, local action is intended, it is probably the best basis that can be selected.

Hydrous wool-fat (Lat. *adeps lanae hydrosus*, syn. *lanolin*) does not easily become rancid, is fairly well absorbed, and can be mixed with an equal weight of aqueous fluid without losing

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its ointment-like consistency. Hence it is probably the best basis when a considerable quantity of liquid must be incorporated. It is, however, rather tough and sticky, and not easily worked; therefore not a very good vehicle for the incorporation of insoluble powders, nor does it lend itself nicely to inunction. These objections may be partially overcome by admixture of one-fifth of petrolatum.

Lard (Lat. *adeps, -ipis*), preferably benzoinated lard, (*adeps benzoinatus*), which does not become rancid so easily, is quite well absorbed, and permits incorporation of quite a proportion of aqueous fluid (about 15 per cent). On account of these properties, and because of its ideal consistence for inunction, it still holds first rank among the ointment bases.

Among the compound ointment bases may be mentioned: *Unguentum* and *unguentum aquae rosae* of the pharmacopœia. (See below.)

It is exceedingly important to avoid the use of rancid ointments. Inasmuch as the early stages of rancidity are not always easily discoverable by the senses, or the odor may be covered up by flavoring, the following test for rancidity may be of value:

Experiment. Mix the suspected fat with a little of a concentrated solution of potassium iodide. Rapidly developing discoloration indicates rancidity; the discoloration is due to decomposition of the potassium iodide with liberation of iodine, and from the rapidity and degree of that discoloration the extent of the change may be approximately estimated. Perform control test with same variety of fresh fat.

The following ointments are official:

	Composition.	Gm.
Unguentum.	White wax,	20,00
Ointment.	Benzoinated lard,	80,00
Unguentum acidi borici,	Boric acid,	10,00
Ointment of boric acid.	Paraffin,	10,00
	White petrolatum,	80,00
Unguentum acidi tannici,	Tannic acid,	20,00
Ointment of tannic acid.	Glycerin,	20,00
	Ointment,	60,00

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Unguentum aquae rosae, Ointment of rose water. (Syn. Cold cream.)	Spermaceti,	12,50
	White wax,	12,00
	Expressed oil of almond,	56,00
	Sodium borate,	0,50
	Stronger rose water,	19,00
Unguentum belladonnae, Belladonna ointment.	Extract of belladonna leaves,	10,00
	Diluted alcohol,	5,00
	Hydrous wool-fat,	20,00
	Benzoinated lard,	65,00
Unguentum chrysarobini, Chrysarobin ointment.	Chrysarobin,	6,00
	Benzoinated lard,	95,00
Unguentum diachylon, Diachylon ointment.	Lead plaster,	50.00
	Oil of lavender flowers,	1.00
	Olive oil,	49,00
Unguentum gallae. Nutgall ointment.	Nutgall,	20,00
	Ointment,	80,00
Unguentum hydrargyri, Mercurial ointment.	Mercury,	50,00
	Oleate of mercury,	2,00
	Prepared suet,	23,00
	Benzoinated lard,	25,00
Unguentum hydrargyri ammoniati, Ointment of ammoniated mercury.	Ammoniated mercury,	10,00
	White petroleum,	50,00
	Hydrous wool-fat,	40,00
Unguentum hydrargyri dilutum, Blue ointment.	Mercurial ointment,	67.00
	Petrolatum,	33.00
Unguentum hydrargyri nitratis, Ointment of mercuric nitrate. (Syn. Citrine ointment.)	Mercury,	7.00
	Nitric acid,	17,50
	Lard,	76,00
Unguentum hydrargyri oxidi flavi, Ointment of yellow mercuric oxide.	Yellow mercuric oxide,	10,00
	Water,	10,00
	Hydrous wool-fat,	40,00
	Petrolatum,	40,00
Unguentum hydrargyri oxidi rubri, Ointment of red mercuric oxide.	Red mercuric oxide,	10.00
	Water,	10.00
	Hydrous wool-fat,	40,00
	Petrolatum,	40,00
Unguentum iodi, Iodine ointment.	Iodine,	4.00
	Potassium iodide,	4.00
	Glycerin,	12,00
	Benzoinated lard,	80,00

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Unguentum iodoformi, Iodoform ointment.	Iodoform,	10,00
	Lard,	90,00
Unguentum phenolis, Phenol ointment.	Phenol,	3,00
	White petrolatum,	97,00
Unguentum picis liquidae, Tar ointment.	Tar,	50,00
	Yellow wax,	15,00
	Lard,	35,00
Unguentum potassii iodidi, Ointment of potassium iodide.	Potassium iodide,	10,00
	Potassium carbonate,	0,60
	Water,	10,00
	Benzoinated lard,	80,00
Unguentum stramonii, Stramonium ointment.	Extract of stramonium,	10,00
	Diluted alcohol,	5,00
	Hydrous wool-fat,	20,00
	Benzoinated lard,	65,00
Unguentum sulphuris, Sulphur ointment.	Washed sulphur,	15,00
	Benzoinated lard,	85,00
Unguentum veratrinae, Veratrine ointment.	Veratine,	4,00
	Expressed oil of almond,	6,00
	Benzoinated lard,	90,00
Unguentum zinci oxidi, Ointment of zinc oxide.	Zinc oxide,	20,00
	Benzoinated lard,	80,00
Unguentum zinci stearatis, Ointment of zinc stearate.	Zinc stearate,	50,00
	White petrolatum,	50,00

Prepare as example:

UNGUENTUM IODI—Iodine Ointment.

Iodine	0,60 Gm.
Potassium iodide	0,60 Gm.
Glycerin	1,80 Gm.
Benzoinated lard	12,00 Gm.

Triturate the iodine and the potassium iodide in a glass mortar with the glycerin until dissolved, then gradually incorporate the benzoinated lard, and mix thoroughly, avoiding the use of a metallic spatula. Preserve in ointment box and label with official name.

Prescribing. The total quantity depends upon the time and place of application, thus eye-salves are to be prescribed in quantities of 5,0 Gm., certainly not exceeding 15,0 Gm., while other ointments may be prescribed in quantities of 30 to 60 Gm., or

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more. As comparatively few ointments are permanent, it is usually not desirable to order more than can be used up in a short time. In case of ointments to be compounded extemporaneously, the signature should be: *"misce fiat unguentum"* (abbr. *m., ft. ung.;* Eng. let an ointment be made).

Ointments are dispensed in ointment boxes or in collapsible tubes; which it is not necessary, however, to specify in the prescription, unless the collapsible tube be especially desired for applications of ointment to rectum or urethra (See p. 55).

The directions to the patient should express the quantity (size of millet-seed, pea, hazelnut, walnut) or the thickness of the application (one-twelfth, one-sixteenth of an inch), whether to be rubbed in or to be spread on lint, flannel, or gauze.

Practice in Prescription-Writing.

PROBLEM 105. For chronic eczema, order 100 Gm. of ointment composed of 1 part of tar ointment and 4 parts of ointment of zinc oxide. Give directions to spread on muslin and apply to affected part under bandage.

PROBLEM 106. Ointment against itching. Phenol and menthol of each, 1,0 Gm. Rose water ointment 30,0 Gm. Directions: Apply to affected part.

PROBLEM 107. Lassar's paste, an exceedingly valuable, soothing ointment in the treatment of skin disease, is composed of salicylic acid, 2%; zinc oxide and powdered stareh, of each 24 parts, white petrolatum, 50 parts. Prescribe a suitable quantity for case of facial eczema.

PROBLEM 108. Parasiticide ointment against ring-worm. Oleate of mercury, 1 part, in ointment of rose water, 10 parts; to be applied twice a day to the affected spot.

PROBLEM 109. Ointment against pubic lice: Ammoniated mercury, 2,0 Gm.; petrolatum, 10,0 Gm.; balsam Peru, 5,0 Gm.; hydrous wool-fat, 15,0 Gm. To be rubbed into the hair.

PROBLEM 110. Sorbefacient for swollen glands, 50% ichthyol in hydrous wool-fat flavored with oil of bitter almond. Directions: Apply thickly, cover with oiled silk and bandage.

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CLASS 2. CERATA. CERATES.

NOM.—*Ceratum;* gen., *cerati;* abbr., *cerat.;* gender, neuter.

PRONUNCIATION.—Lat. se-ra'-tum.

ORIGIN OF NAME.—From Lat. *cera*, wax, the usual stiffening agent.

DEFINITION.—**Fatty preparations resembling ointments but firmer and of higher melting point** (above 104° F.); being of such consistency that they can be spread upon muslin or other backing and yet will not melt and run through the dressing when applied to the skin. They are mostly used as protective applications for inflamed surfaces.

The following cerates are official:

	Composition.	Gm.
Ceratum,	White wax,	30,00
Cerate.	White petrolatum,	50,00
	Benzoinated lard,	50,00
Ceratum camphorae,	Camphor liniment,	10,00
Camphor cerate.	White wax,	35,00
	White petrolatum,	15,00
	Benzoinated lard,	40,00
Ceratum cantharidis,	Cantharides, in powder,	32,00
Cantharides cerate.	Liquid petrolatum,	15,00
(Syn. Blistering cerate.)	Yellow wax,	18,00
	Rosin,	18,00
	Lard,	17,00
Ceratum plumbi subacetatis,	Solution of lead subacetate,	20,00
	Wool-fat,	20,00
Cerate of lead subacetate. (Syn. Goulard's cerate.	Paraffin,	20,00
	White petrolatum,	38,00
	Camphor,	2,00
Ceratum resinae,	Rosin,	35,00
Rosin cerate. (Syn. Basilicon ointment.)	Yellow wax,	15,00
	Lard,	50,00
Ceratum resinae composi-	Rosin,	22,50

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Prepare the following prescription:

℞
Cerati cantharidis, q. s.
Fiat emplastrum 3x3 Cm.
Extende super emplastrum adhaesivum.
Sig. Apply over tender point, and allow to remain for 6 or 8 hours, or until blister is produced.

Into a piece of wrapping paper cut a hole, 3 square centimeters in size. This is to serve as a pattern for spreading the plaster. Brush the paper pattern well with thin soft soap so as to keep it from sticking and place it over a piece of adhesive plaster, 5 square centimeters in size, so as to leave a margin of 1 centimeter all around. Now soften the cantharides cerate by working it in the hand for a minute or two; and then spread evenly, by means of a slightly warmed spatula, over that part of the adhesive plaster left exposed by the paper pattern. The cerate is to be applied of such thickness that the yellow color of the adhesive plaster should be obliterated when it is held up to the light. When spread, remove the pattern, take off any soap adhering to the plaster by means of a wet cloth, and cover the blistering plaster thus obtained with waxed paper. Put in paper envelope and label with above transcription. This preparation is commonly called cantharides plaster.

Prescribing. Cerate (*ceratum*) may be used as a vehicle for extemporaneous cerates whose subscription would be: *misce et fiat ceratum*, abbr., *m. et ft. cerat.;* mix and let a cerate be made.

Practice in Prescription-Writing.

PROBLEM 111.—Prescribe 60,0 Gm. of rosin cerate with directions to spread on linen and apply to ulcer.

PROBLEM 112. Prescribe cerate containing 2% of salicylic acid. To be applied to corn morning and evening.

CLASS 3. CATAPLASMATA. CATAPLASMS.

(Poultices.)

NOM.—*Cataplasma;* gen., *cataplasmatis;* gender, neuter.

PRONUNCIATION.—Lat. kat-ap-laz'-mah. Eng. kat'-ap-lazms.

ORIGIN OF NAME.—From Gr. *kataplassein,* spread over, Fr. *kata,* down, and *plassein,* form, shape.

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DEFINITION.—**Soft and moist preparations intended for external application.** They are of such consistence that they accommodate themselves accurately to the surface to which they are applied, without being so liquid that they spread over adjoining parts, or so tenacious as to adhere firmly to the skin.

They are mainly used for the purpose of applying heat and moisture to parts of the body, thereby inducing relaxation. They may, however, serve as vehicles for medicament.

Any material that will long retain moisture may be used as a basis for a poultice; these bases being divisible into two classes: (1) the fermentable, (2) the non-fermentable.

1. The fermentable poultice bases named somewhat in order of usefulness are: Linseed meal, ground elm bark, starch, bread, and bran. Indeed, any coarsely powdered vegetable drug might serve the purpose. These mixed with hot water to form a dough or paste constitute the old-time poultice. Their advantage is their cheapness and the readiness with which they can be obtained. Their disadvantage is that they are excellent culture media for bacteria and if used upon the skin for any length of time are liable to cause infection and the eruption of pustules or furuncles.

The more modern non-fermentable poultice is exemplified by the only poultice of the pharmacopœia.*

	Composition.	Gm.
Cataplasma kaolini,	Kaolin,	57,70
Cataplasm of kaolin.	Boric acid,	4,50
	Thymol,	0,05
	Methyl salicylate,	0,20
	Oil of peppermint,	0,05
	Glycerin,	37,50

This paste is used by heating it on the water-bath; then spreading it rather thickly and as hot as the patient will bear over the affected part, covering with cotton and bandage.

This preparation may likewise serve as an example of the pastes (Lat. *pasta,-ae*), which are doughy masses intended for external application, differing from ointments in being made with glycerin, mucilage, or other aqueous vehicle instead of fat.

* The most important modern substitute for the old-fashioned poultice is undoubtedly the fomentation; i. e. clothes wrung out of hot water or hot medicated fluid, and applied hot.

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Pastes are prescribed like pill masses; the druggist being directed to add enough of the fluid to make a paste (Lat. *quantum sufficiat ut fiat pasta;* abbr., *q. s. ut ft. pasta*), as the latter can easily ascertain the quantity necessary for the purpose while preparing the paste.

In prescribing the old time poultice, the ingredients that are to constitute the poultice basis are prescribed as species (q. v.). About 100 Gm. of ground drug is necessary for a medium size poultice. Enough for at least two poultices should be prescribed, so that one may be warmed while the other is applied. The directions to the patient would be: make a poultice of it. In case the patient be not familiar with the preparation of poultices, he should be given explicit instructions somewhat like those given below.

Prepare as example:

LINSEED POULTICE.

Into 250,0 Cc. of boiling water stir 100,0 Gm. of linseed meal. Rapidly spread the mush thus obtained upon a piece of cloth up to within about 2 inches of the edge; cover with a thin piece of muslin and fold the edges of the cloth over it. The poultice is ready for immediate application to the skin.

The proper temperature is that which is just easily borne by the back of the hand. If the poultice is too hot, place a piece of cloth over its face. In order to have the heat retained as long as possible, counteract heat dissipation by covering the poultice; first with some waterproof material, oiled silk, rubber cloth, parchment, or oiled paper to prevent evaporation; place over this a non-conductor of heat, e. g. a thick layer of cotton, keeping the whole in place with an appropriate bandage. When the poultice has become lukewarm another should be in readiness to take its place before the first one is removed. A poultice may be used again and again, simply requiring reheating each time which is best done in a double boiler.

Practice in Prescription-Writing.

PROBLEM 113.—For spice poultice, an excellent counterirritant for prolonged application. Prescribe enough for moderate size

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poultice of: Crushed allspice, cloves, nutmeg, and cinnamon, equal parts; pepper ½ part. Give directions to sew up in flannel bag, moisten with warm alcohol and apply to abdomen.

PROBLEM 114.—"Pick's paste" for use in the eczema of children, where a mask or ointment cannot be applied: Tar, 1,0; zinc oxide, 4,0; powdered tragacanth, 4,0; glycerin, 45,0; rose water, 120,0. Directions: Apply to face.

DIVISION 3. SOLID EXTERNAL PREPARATIONS.

CLASS 1. EMPLASTRA, PLASTERS.

NOM.—*Emplastrum;* gen., *emplastri;* acc., *emplastrum;* abbr., *empl.*, gender, neuter.

PRONUNCIATION.—Lat. em-plas'-trum.

ORIGIN OF NAME.—Fr. Gr. *emplassein*, to plaster up.

DEFINITION.—**Plasters are solid masses which after softening by heat can be spread upon some backing, and which become adhesive at the temperature of the body.** Plasters differ from cerates in being more adhesive and in being stiffer so that they require to be melted before they can be spread.

The purposes of plasters may be (a), mechanical, by affording protection and support, and (b), medicinal, by slow absorption of remedial agents on prolonged contact with the skin.

The following plasters are official:

	Composition.	Gm.
Emplastrum adhaesivum, Adhesive plaster.	Rubber,	2,00
	Petrolatum,	2,00
	Lead plaster,	96,00
Emplastrum belladonnae, Belladonna plaster.	Extract of belladonna leaves,	30,00
	Adhesive plaster,	70,00
Emplastrum capsici, Capsicum plaster.	Oleoresin of capsicum,	0,25
	Painted over adhesive plaster, spread on fabric 15x15 Cm.	
Emplastrum hydrargyri,	Mercury,	30,00

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Emplastrum opii, Opium plaster.	Extract of opium,	6,00
	Water,	8,00
	Adhesive plaster,	90,00
Emplastrum plumbi, Lead plaster. (Syn. Diachylon plaster.)	Soap,	100,00
	Lead acetate,	60,00
	Water, a sufficient quantity.*	
Emplastrum saponis, Soap plaster.	Soap,	10,00
	Lead plaster,	90,00
	Water, a sufficient quantity.	

It will be noticed that lead plaster is the basis of the official plasters. It has the advantage of being quite devoid of irritating properties, and of yielding to absorption medicament mixed with it. It is somewhat deficient in adhesiveness, which is overcome in adhesive plaster by the addition of rubber. The greatest disadvantage of these plasters is that they do not keep well when spread, as they soon become brittle and discolored; hence they are kept in form of a mass which is spread when needed by melting it, pouring it upon the cloth or leather, and spreading rapidly with a heated spatula.

These plasters may be prescribed by ordering a sufficient quantity of the plaster to be spread over thin leather (Lat. *aluta, -ae*) of the desired size; as in the following example:

℞
Emplastri plumbi q. s.
Extende super alutam 5x5 Cm.
Sig. Apply to bed-sore.

Prepare above prescription by gently melting about 5 Gm. of lead plaster in a porcelain dish over the water-bath. While the plaster is melting, cut a hole of the required size in a piece of wrapping-paper; this furnishes the pattern. Cut a piece of chamois leather, allowing 1 Cm. all around for margin. Place the leather on a thick pad of paper, put on the pattern, which has previously been wetted, and tack it down, preferably with thumb-tacks. Warm the blade of a spatula in a gas-flame. Now pour the melted plaster on the leather near the margin; and spread evenly by means of the warmed blade. Cover the face

* On mixing a solution of soap (sodium oleo-palmitate) and lead acetate double decomposition occurs, resulting in the formation of sodium acetate and lead oleo-palmitate, the insoluble lead soap known as lead plaster.

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of the plaster with waxed paper; and preserve in an envelope, labelled as directed.

Hand-spread plasters are rarely prescribed nowadays, owing to the introduction of rubber plasters, which are endowed with excellent keeping qualities when spread, so that they can be kept at hand ready for use. As rubber plasters can only be made and spread successfully by complicated machinery, almost all plasters are at present bought already spread by the manufacturer. Spreading of plasters by hand has almost become a lost art. A disadvantage of rubber plasters lies in the fact that medicament incorporated with them does not readily penetrate the skin, so that while they are excellent for merely mechanical purposes, they are less suitable when medicinal action is aimed at. Plasters containing rubber are more irritating than is lead plaster or soap plaster. Machine spread plasters are prescribed by the square inch or square centimeter, as in the following example:

℞ Counterirritant in pleurisy.
Emplastrum* capsici, 4″x5″.
Sig. Apply to chest.

Plasters are often perforated with numerous little holes (porous plasters) for the purpose of permitting escape of the secretions of the skin, which, if retained, would prove irritating. The face of plasters is usually covered with muslin or oiled paper, so as to keep the plaster from sticking to the wrappings. Of course, the covering must be removed before the plaster can be applied to the skin. If the plaster be deficient in adhesiveness, this can generally be remedied by warming or by wetting with alcohol. If a plaster is to be applied to a hairy part, the hair should be shaved off before application of the plaster, as otherwise the removal of the plaster is very painful. For removal the plaster is stripped off by force; if difficult to start, a corner may be loosened by moistening with oil of turpentine.

Practice in Prescription-Writing.

PROBLEM 115. Prescribe belladonna plaster, 10 Cm. by 15 Cm. in size; with directions to apply over painful part and allow it to remain.

* Accusative because direct object of recipe.

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CLASS 2. CHARTAE. PAPERS.

NOM.—*Charta;* gen., *chartae;* gender, female.

PRONUNCIATION.—Kar'-tah.

DEFINITION.— **Paper treated with medicinal substances.**

Only one paper is official: *Charta sinapis.* Mustard paper. Paper to which mustard, deprived of its oil, is affixed by means of rubber solution. Before it is applied to the skin, it should be dipped in water for about 15 seconds.

Examine mustard paper, and dip in water. What has occurred? See reference list.

Practice in Prescription-Writing.

PROBLEM 116. Prescribe mustard paper, 3″x4″; to be applied to pit of the stomach.

CLASS 3. PULVERES ADSPERSORII. DUSTING POWDERS.

NOM.—*Pulvis adspersorius.*

DEFINITION.— **Finely powdered substances for external use.**

The most important effect peculiar to dusting powders is their drying action, produced by virtue of capillary attraction exerted by the minute spaces existing between the granules of powder. This drying action endows even absolutely insoluble powders, such as talcum, with a certain amount of antiseptic power: as microbes cannot flourish without moisture. Hence their importance in the treatment of moist skin affections.

Dusting powders are also sometimes employed for application to various mucous membranes; such as the conjunctiva, the nose (snuffing powders), the larynx, or the urethra.

They are prescribed like powders for internal use (q. v.); and are dispensed in boxes or bottles.

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Practice in Prescription-Writing.

PROBLEM 117. Astringent dusting powder for moist skin disease. Zinc oxide and lead carbonate, of each 2,0 Gm.; talcum, 50,0. To be dispensed in a box. Directions: dusting powder.

PROBLEM 118. For odor and sweating of feet. Salicylic acid, 2 Gm.; boric acid, 4 Gm.; talcum, 15 Gm. Dust over feet.

PROBLEM 119. Anderson's antipruritic powder. Powdered camphor, 6,0 Gm., zinc oxide, 15,0; powdered starch, 30,0 Gm.

PROBLEM 120. Ferrier's snuff for coryza. Morphine hydrochloride, 0,10 Gm.; powdered acacia, 8 Gm.; bismuth subnitrate, 24 Gm. Not more than one-quarter of this quantity to be used in the 24 hours.

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PART III.

REFERENCE LIST.

This list aims to give, in a most concise manner, the principal data needed for the prescribing of the official drugs. The following arrangement has been adopted:

1. The official Latin name. 2. Its pronunciation, enclosed in parentheses. 3. The genitive of the official Latin name, as this is the case most needed in prescription-writing. 4. The official English name; its accentuation indicated whenever it differs from the Latin. 5. Synonym, if any. 6. The origin, in case of vegetable drugs.

7. A concise description.

8. Solubility (abbr. sol.) in case of chemicals; the figures quoted standing for parts of the solvent needed to dissolve one part of the chemical at the standard temperature of 25°C (77°F).

9. Composition (abbr. comp.) in case of vegetable drugs.

10. Incompatibles (abbr. inc.).

11. Uses.

12. The pharmacopoeial average dose in case of drugs likely to be given internally. This dose is not intended to be obligatory; more or less may be given, as the case may require.

13. The official preparations. (abbr. prep.)

14. Average dose of each preparation.

15. Administration (abbr. adm.). Most popular form of administration, and methods of disguising.

ACACIA. (Ah-ka'-she-ah.) **Acaciae. Acacia.** Syn.-Gum Arabic
A gummy exudation from *Acacia senegal* and other species of acacia.
Roundish or angular, transparent, yellowish pieces; odorless; taste insipid, mucilaginous.

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Sol.—2 of water; insoluble in alcohol.

Comp.—Arabin combined with calcium, magnesium, and potassium.

Inc.—1. The official mucilage is gelatinized by rather strong solutions of **ferric salts,** or by a saturated solution of **borax.** Dilution of both mucilage and solution with equal quantity of water will prevent the precipitation. 2. **Lead subacetate,** even if highly diluted will give a white precipitate. 3. **Sulphates, oxalates,** or **carbonates** may produce precipitate, owing to the presence of calcium. 4. **Alcohol,** present to the extent of 50 or 60 per cent is physically incompatible.

Uses.—Demulcent, excipient. **Dose, any quantity.**

Prep.—1. **Mucilago acaciae.** (34%.) **Dose, 16 Cc.**

2. **Syrupus acaciae.** (10%.) **Dose, any quantity.**

ACETANILIDUM. (As-et-an-il-i'-dum.) **Acetanilidi. Acetanilide:** Syn. Antifebrin.

A white, laminated, crystalline powder; odorless; taste, slightly burning.

Sol.—179 of water; 2,5 of alcohol; 12 of ether; 5 of chloroform.

Inc.—1. Aqueous solution is precipitated by alkaline **bromides** and **iodides.** 2. It is slowly decomposed by strong solutions of **potassium** or **sodium hydroxide,** yielding anilin. 3. Color reactions.—With **spirit of nitrous ether, amyl nitrite,** or **nitrous acid** (yellow, becoming red); with **tincture of ferric chloride** (red) 4. Softening or liquefaction occurs on trituration with **phenol, resorcinol, thymol, pyrocatechin, antipyrin.**

Uses.—Antiseptic, analgesic, antipyretic, sudorific. **Dose, 0,25 Gm.**

Prep.—**Pulvis acetanilidi compositus** (70%). **Dose, 0,50 Gm.**

Adm.—Powders (with sugar), capsules, tablets, or pills. For prompt effect, in aromatic alcoholic solution, e. g. compound tincture of lavender with spirit of chloroform (0,6 Cc.), to be taken diluted with a little water. See also acetphenetidinum.

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ACETONUM. (As-et-o'-num.) **Acetoni. Ac'etone.**

A transparent, colorless, mobile and volatile liquid of an ethereal characteristic odor and a pungent, sweetish taste.

Sol.—Mixable with water, alcohol, ether, chloroform, and volatile oils.

Uses.—Solvent for resins, oleoresins, fats, etc.

ACETPHENETIDINUM. (As-et-fe-net-i'-din-um.) **Acetphenetidini. Acetphenet'idin.** Syn.—Phenacetin. White, glistening, crystalline scales, or a fine crystalline powder, odorless and tasteless.

Sol.—925 of water; 12 of alcohol; 63 of ether; 20 of chloroform; also soluble in glycerin.

Inc.—1. Decomposed by **strong acids** or **alkalies.** 2. Color reactions. With many **oxidizing agents** pink to red. 3. Softening or liquefaction when triturated with **phenol, chloral hydrate, pyrocatechin.**

Uses.—Antipyretic, analgesic. **Dose, 0,50 Gm.**

Adm.—Powders, capsules, or pills. May be suspended by means of mucilage of acacia in aromatic water, e. g. peppermint water, sweetened with syrup.

ACETA.—See p. 131.

ACIDA. Acids.

Incompatibles in general.

1. **Acids and alkalies are incompatible.** They combine forming salts.
2. **Strong acids are incompatible with salts of weaker acids.** As the strong acid displaces the weaker acid.

Strong acids are: Sulphuric,* nitric,* hydrochloric.*

Moderately strong acids are: phosphoric,* sulphurous, tartaric, citric, lactic, acetic.

Weak acids are: Carbonic, hydrocyanic, hydrosulphuric, silicic, boric, salicylic, benzoic.

3. Mineral and many organic acids precipitate potassium bitartrate from concentrated solutions of **sodium and potassium tartrate, normal potassium tartrate,** or **double tartrates containing potassium.**
4. Mineral acids give a precipitate of ferric phosphate or

*Usually called the mineral acids.

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ferric pyrophosphate when added to a solution of the official **soluble ferric phosphate** or **soluble ferric pyrophosphate.**

5. Strong mineral acids, and many organic acids in the presence of mineral acids, form esters and ethers with **alcohol.**
6. Many acids precipitate **proteids** from aqueous solution.
7. **Pancreatin** is inhibited in its action by acids.

ACIDUM ACETICUM. (As'-id-um as-e'-tik-um.) **Acidi acetici. Acetic acid.**

A clear, colorless liquid, having a strong, vinegar-like odor, and a purely acid taste. Contains 36% of absolute acid.

Sol.—Mixible with water and alcohol.

Inc.—(a) Those of acids. (See acida.) Acetic acid is a rather weak acid, being driven out of its salts by the **stronger mineral acids**; on the other hand, it decomposes **carbonates.**

(b) Soluble acetates, or the free acid give a dark red coloration with **ferric salts.**

Uses.—Irritant, styptic, refrigerant.

Prep.—**Acidum aceticum dilutum.** (6%.) **Dose, 2 Cc.**

Adm.—The diluted acid mixed with 1 to 4 parts of water, and sweetened, if desired.

ACIDUM ACETICUM GLACIALE. (As'-id-um as-e'-tik-um gla-she-a'-le). **Acidi acetici glacialis. Gla'cial acetic acid.**

A clear, colorless liquid of a strong, vinegar-like odor, and a very pungent, acid taste. Contains 99% of absolute acid.

Sol. and Inc.—Same as acidum aceticum.

Uses.—Caustic.

ACIDUM BENZOICUM. (As'-id-um ben-zo'-ik-um.) **Acidi benzoici. Benzoic acid.** An organic acid obtained

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Sol.—281 of water; solubility increased by borax, alkali citrates, or sodium phosphate; 1.8 of alcohol; 3 of ether; 7 of chloroform; readily soluble in carbon disulphide, benzene, fixed and volatile oils; sparingly soluble in petroleum benzin.

Inc.—Those of weak acids. It liberates carbon dioxide from **carbonates.**

Uses.—Antiseptic, diuretic, expectorant. **Dose, 0,50 Gm.**

Adm.—In capsule or suspended in flavoring syrup, or dissolved in aromatic spirit, to which a little flavoring syrup may be added.

ACIDUM BORICUM. (As'-id-um bo'-rik-um.) **Acidi borici. Boric acid.** Syn. Boracic acid.

Transparent colorless scales of a somewhat pearly lustre, or a light white, very fine powder, slightly unctuous to the touch and having a faintly bitterish taste.

Sol.—18 of water; 4.6 of glycerin; 15.3 of alcohol.

Inc.—Those of very weak acids. (See acida.)

It decomposes **carbonates** of the alkalies and of the alkaline earths.

Uses.—Mild antiseptic. **Dose, 0,50 Gm.**

Prep.—1. **Glyceritum boroglycerini** (31%).

2. **Unguentum acidi borici.** (10%.)

3. **Liquor antisepticus.** (2%.) **Dose, 4 Cc.**

Adm.—Taste may be corrected by compound tincture of gentian.

ACIDUM CAMPHORICUM. (As'-id-um kam-for'-ik-um.) **Acidi camphorici, Camphoric acid.** Obtained from camphor by oxidation with nitric acid.

Colorless, odorless crystals or plates, of slightly acid taste.

Sol.—125 of water, readily in alcohol; less soluble in ether and chloroform; soluble in fatty oils.

Uses.—Antihydrotic.

Adm.—In powders, in capsules, or in elixir. **Dose, 1 Gm.**

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Sol.—0,54 of water; 1,55 of alcohol; 18 of ether.

Inc.—(a) Those of acids. (See acida.) Citrates are transposed by **dilute mineral acids**; while citric acid decomposes **carbonates, acetates,** and **alkaline sulphides.**

(b) While most citrates, excepting those of the alkali metals, are insoluble; citric acid in excess converts the insoluble citrates into the more soluble acid citrates.

Uses.—Flavoring agent, refrigerant. **Dose, 0,50 Gm.**

Prep.—**Syrupus acidi citrici. (1%.) Dose, any quantity.**

ACIDUM GALLICUM. (As'-id-um gal'-ik-um.) **Acidi gallici. Gallic acid.** An organic acid, usually prepared from tannic acid.

White, or pale fawn-colored, silky, interlaced needles, odorless, having an astringent and slightly acidulous taste.

Sol.—83,7 of water; 4,14 of alcohol; 12 of glycerin; 40 of ether; very slightly soluble in chloroform, benzene, or petroleum benzin.

Inc.—More or less similar to those of tannic acid (see acidum tannicum). It does not, however, precipitate solutions of alkaloids, gelatin, albumin, or starch.

Uses.—Astringent (?). **Dose, 1 Gm.**

Adm.—In powders (with sugar) or capsules.

ACIDUM HYDRIODICUM DILUTUM. (As'-id-um hi-dre-od'-ik-um di-lu'-tum.) **Acidi hydriodici diluti. Diluted hydriodic acid.**

A colorless, odorless, sour liquid, containing **10%** of the absolute acid and 90% of water.

Sol.—Mixable in all proportions with water or alcohol.

Inc.—(a) Those of acids. (See acida.) (b) Those of iodides, which are: 1. Solutions **of salts of lead, silver,** and **mercury** are precipitated as iodides of the respective metal. The alkali iodides in excess form soluble double compounds with these precipitates. 2. **Oxidizing agents** liberate iodine. Strong oxidizing agents, such as **chlorine, chlorates, nitric** or **nitrohydrochloric acid** oxidize the liberated iodine to iodic

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acid. **Ferric, cupric,** and **arsenic** compounds liberate iodine; ferric salts without producing precipitates; cupric salts give white precipitate of cuprous iodide. 3. **Arsenous acid** or **potassium arsenite** yield sparingly soluble double salt with concentrated solution of potassium iodide. 4. **Bismuth subnitrate** is changed to yellow and then to deep red by iodides. 5. **Spirit of nitrous ether,** or **nitrites** in acid solution, liberate iodine from iodides and give off oxides of nitrogen. 6. The iodides precipitate aqueous solutions of **many alkaloidal salts,** e. g., of strychnine sulphate, giving rise to a particularly dangerous incompatibility.

Uses.—Alterative. **Dose, 0,5 Cc.**

Prep.—**Syrupus acidi hydriodici.** (1%.) **Dose, 4 Cc.**

ACIDUM HYDROBROMICUM DILUTUM. (As′-id-um hi-dro-bro′-mik-um di-lu′-tum.) **Acidi hydrobromici diluti. Diluted hydrobromic acid.**

A clear, colorless, odorless, sour liquid, composed of 10% of absolute hydrobromic acid and 90% of water.

Sol.—Mixable in all proportions with water or alcohol.

Inc.—(a) Those of acids. (See acida.) (b) Those of bromides, which are: 1. Solutions of salts of **lead, silver,** and **mercurous mercury,** precipitated as bromides. 2. Strong **oxidizing agents,** which liberate bromine. 3. Certain **alkaloids,** especially strychnine precipitated from solutions of their salts. The presence of alcohol generally prevents this precipitation.

Uses.—Sedative nervine. **Dose, 4 Cc.**

Adm.—Prescribed with syrup; and given freely diluted.

ACIDUM HYDROCHLORICUM. (As′-id-um hi-dro-klo′-rik-um.) **Acidi hydrochlorici. Hydrochloric acid.** Syn. Muriatic acid.

A colorless fuming liquid, of a pungent odor, and an intensely acid taste. It contains 31.9% of absolute acid.

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precipitate as chlorides: solutions of salts of **lead, silver,** and **mercurous mercury.**

Uses.—Caustic; in diluted form, stomachic.

Prep.—**Acidum hydrochloricum dilutum.** (10%.)
Dose, 1 Cc.

Adm.—Well diluted and taken through tube. May be prescribed with aromatic bitter, e. g., compound tincture of gentian.

ACIDUM HYDROCYANICUM DILUTUM. (As'-id-um hi-dro-se-an'-ik-um di-lu'-tum.) **Acidi hydrocyanici diluti. Diluted hydrocyanic acid.** Syn., Prussic acid.

A colorless liquid of characteristic odor and taste, resembling that of bitter almond. It contains 2% of absolute acid.

Sol.—Mixable with water, alcohol, glycerin.

Inc.—Almost universally incompatible. It is very unstable.

Uses.—Antemetic, analgesic, antipruritic. **Dose, 0,1 Cc.**

Adm.—Externally aqueous solution (up to 10%), applied to unbroken skin. Internally, with flavoring syrup, aromatic water, or emulsion of almond.

ACIDUM HYPOPHOSPHOROSUM. (As'-id-um hi-po-fos-fo-ro'-sum.) **Acidi hypophosphorosi. Hypophospho'rous acid.**

A colorless, odorless, acid liquid, containing 30% of absolute acid.

Sol.—Mixable in all proportions with water.

Inc.—Hypophosphites are powerful reducing agents, and are incompatible with nearly all **oxidizing agents.**

Uses.—Tonic.

Prep.—**Acidum hypophosphorosum dilutum.** (10%.)
Dose, 0,5 Cc.

Prep.—1. **Syrupus hypophosphitum.** (0,2%.)
Dose, 8 Cc.

2. **Syrupus hypophosphitum compositus.** (1,5%.) **Dose, 8 Cc.**

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A colorless syrupy liquid, of a purely acid taste. Contains 75% of absolute acid.

Sol.—Freely mixable with water, alcohol, or ether.

Inc.—(a) Those of acids. (See acida.) Lactic acid displaces **acetic** and **carbonic** acids from their compounds. (b) Lactates are generally insoluble in water and in alcohol. Decomposed by **strong oxidizing agents.**

Uses.—Solvent for false membranes. **Dose, 2 Cc.**

Adm.—With glycerin, or syrup.

ACIDUM NITRICUM. (As'-id-um ni'-trik-um.) **Acidi nitrici. Nitric acid.**

A colorless fuming liquid, of peculiar, somewhat suffocating odor. Contains 68% of absolute acid.

Sol.—Mixable with water; decomposes alcohol.

Inc.—(a) Those of strong acids. (b) Those of strong oxidizing agents. Liable to cause explosion or ignition with many **reducing agents.**

Uses.—Caustic; in dilute form, astringent.

Prep.—1. **Acidum nitricum dilutum.** (10%.) **Dose, 2 Cc.**

Adm.—The diluted acid, with syrup of orange; or with compound tincture of gentian; to be taken well diluted, through glass tube.

ACIDUM NITROHYDROCHLORICUM. (As'-id-um ni-tro-hi-dro-klo'-rik-um.) **Acidi nitrohydrochlorici. Nitrohydrochloric acid.**

Syn.—Nitromuriatic acid. Aqua regia.

Prepared from nitric acid, 18 parts; hydrochloric acid, 82 parts. A golden-yellow, fuming, and very corrosive liquid, having a strong odor of chlorine.

Comp.—Contains nitrosyl chloride (NOCl), free chlorine, etc.

Inc.—1. A powerful oxidizing agent; **almost universally incompatible.** 2. It undergoes change on keeping, and on dilution with water.

Uses.—Stimulant to liver and other glands of alimentary tract in indigestion, biliousness, etc. **Dose, 0,2 Cc.**

Prep.—**Acidum nitrohydrochloricum dilutum.** (Nitric acid, 4; hydrochloric acid, 18,2; water, to make 100.) **Dose, 1,0 Cc.**

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Adm.—The freshly prepared, strong acid should be prescribed in a dark-colored, glass-stoppered bottle. Dose, freely diluted, to be taken through a tube after meals.

ACIDUM OLEICUM. (As'-id-um o-le'-ik-um.) **Acidi oleici. O'leic acid.** A yellowish or brownish-yellow, oily liquid, having a peculiar lard-like odor and taste.

Sol.—Insoluble in water; soluble in alcohol, chloroform, benzene, petroleum benzin, and fixed and volatile oils.

Inc.—Decomposed by strong **oxidizing agents.** With **alkalies,** it forms soaps.

Uses.—In preparation of oleates.

ACIDUM PHOSPHORICUM. (As'-id-um fos-for'-ik-um.) **Acidi phosphorici. Phosphoric acid.**

A colorless liquid of syrupy consistence, without odor, but having a strongly acid taste. Contains 85% of absolute acid.

Sol.—Mixable with water and alcohol.

Inc.—(a) Those of acids. (See acida.) It is weaker than **nitric, hydrochloric,** and **sulphuric** acids. (b) 1. It partially precipitates solutions of **silver nitrate** and **lead acetate.** 2. Phosphoric acid when added to a solution of **soluble ferric phosphate** or **soluble ferric pyrophosphate** produces a white precipitate of ferric phosphate or pyrophosphate.

Uses.—Refrigerant.

Prep.—**Acidum phosphoricum dilutum.** (10%.)

Dose, 2 Cc.

Adm.—See acidum nitricum.

ACIDUM SALICYLICUM. (As'-id-um sal-is-il'-ik-um.) **Acidi salicylici. Salicylic acid.**

Light, fine, white needles, or a light, white, crystalline powder; odorless, or having a slight gaultheria-like odor, with a sweetish, afterwards acrid taste.

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phates of the alkalies, by potassium nitrate, and by sodium sulphite.

Inc.—(a) Those of acids. It liberates carbon dioxide from **carbonates**; and hydriodic acid from **potassium iodide**, the solution becoming brown after a few days from liberation of iodine. **Mineral acids** and **some organic acids**, on the other hand, liberate salicylic acid from solutions of the salicylates. (b) 1. Salicylates precipitate **lead acetate, silver nitrate, lime, quinine sulphate**, from their aqueous solutions. 2. A damp powder or a liquid results when **lead acetate, sodium phosphate, ethyl carbamate**, or **antipyrine** are rubbed with salicylic acid. 3. Color reactions are obtained with **ferric salts** (violet), **copper sulphate** (green), **bismuth subnitrate** (orange), **spirit of nitrous ether** (yellow to red-brown). Aqueous solutions of salicylates, especially if alkaline, become red-brown on exposure to the air, which can be prevented by addition of a small proportion of sodium thiosulphate. 4. **Strong oxidizing agents**, such as potassium chlorate, potassium permanganate, and the halogens, decompose salicylates.

Uses.—Antiseptic, irritant, cholagogue, antirheumatic. **Dose, 0,5 Gm.**

Adm.—By means of 1 or 2 parts of potassium citrate it can be dissolved in aromatic water (e. g., cinnamon water), the solution may be sweetened with syrup of orange.

ACIDUM STEARICUM. (As'-id-um ste-ar'-ik-um.) **Acidi stearici. Stearic acid.**

A hard, white, somewhat glassy solid, odorless and tasteless.

Sol.—Insoluble in water; soluble in 16,6 of alcohol; readily soluble in ether.

Inc.—1. It combines with **alkali hydrates** and **carbonates** to form stearates. 2. **Strong oxidizing agents**, such as nitric acid, decompose it.

Uses.—In the manufacture of glycerin suppositories.

ACIDUM SULPHURICUM. (As'-id-um sul-fu'-rik-um.) **Acidi sulphurici. Sulphuric acid.** Syn. Oil of vitriol.

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A colorless liquid of oily consistency, containing 92,5% of absolute acid.

Sol.—Mixable with water in all proportions; with alcohol forms ethylsulphuric acid and then ether.

Inc.—(a) Those of acids. (See acida.) 1. Sulphuric acid transposes the **salts of nearly all other acids.** 2. With **chlorates,** the concentrated acid causes a detonation. 3. The concentrated acid decomposes most **organic substances,** forming a black mass with many; thus, the undiluted acid carbonizes syrups. (b) Those of sulphates. Sulphuric acid and soluble sulphates precipitate as sulphates: solutions of salts of **lead, barium, calcium** (in concentrated solution), and of **strontium.**

Uses.—Corrosive; in diluted form, astringent.

Prep.—1. **Acidum sulphuricum dilutum.** (10%.) **Dose, 2 Cc.** 2. **Acidum sulphuricum aromaticum.** Aromatic sulphuric acid, (Syn. Elixir of vitriol) contains 20% by weight of absolute acid dissolved in alcohol, with oil of cinnamon and tincture of ginger as aromatics. Incompatible with water. **Dose, 1 Cc.**

Adm.—The diluted acid with aromatic water (e. g., peppermint water) and syrup (e. g., syrup of ginger). The aromatic sulphuric acid is especially suitable for internal administration; it may be prescribed with an alcoholic vehicle (e. g., tincture of sweet orange peel). Must be freely diluted and taken through a tube.

ACIDUM SULPHUROSUM. (As'-id-um sul-fu-ro'-sum.) **Acidi sulphurosi. Sul'phurous acid.**

A colorless liquid of the characteristic odor of burning sulphur, and of a very acrid, sulphurous taste. Contains 6% of sulphur dioxide.

Sol.—Mixable with water and alcohol.

Inc.—(a) Those of acids. (See acida.) Sulphites are decomposed by **nearly all acids,** except carbonic, boracic, hydrocyanic, and in some instances hydrosulphuric. (b) Sulphurous acid and sulphites act as reducing agents toward **oxidizers.**

Uses.—Deodorant, disinfectant, parasiticide. **Dose, 2 Cc.**

Adm.—With spirit of chloroform (0.5 Cc.) and water.

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ACIDUM TANNICUM. (As'-id-um tan'-ik-um.) **Acidi tannici. Tannic acid.** Syn.—Tannin. Gallotannic acid. Digallic acid. An organic acid extracted from nutgall.

A light yellowish amorphous powder, usually cohering in form of glistening scales or spongy masses; odorless, or having a faint characteristic odor, and a strongly astringent taste.

Sol.—0,34 of water; 0,23 of alcohol; 1 of glycerin; sparingly soluble in absolute alcohol; almost insoluble in absolute ether, chloroform, benzene, and petroleum benzin. Its aqueous solution changes, forming chiefly gallic acid, which being less soluble is deposited; the presence of glycerin or of alcohol prevent or retard this change.

Inc.—1. With **alkali hydrates** or **carbonates,** in dilute solution, it forms soluble tannates; with concentrated solution, a precipitate is liable to form. 2. Strong solutions of tannic acid are precipitated by **concentrated mineral acids,** or **saturated solutions of mineral salts.** 3. Tannic acid gives a precipitate with **salts of nearly all metals,** especially with lead, silver, mercury, bismuth, and antimony. 4. It precipitates **nearly all alkaloids** from aqueous solutions of their salts, **some glucosides, neutral and bitter principles, albumin, gelatin, glutin,** or **starch.** It precipitates aqueous solutions of **antipyrine.** 5. It gives color reactions with **ferric salts** (blue-black to green-black); with **potassium cyanide** (green); with **spirit of nitrous ether, amyl nitrite,** or **nitrous acid** (deep red), causing decomposition and formation of gaseous compounds. 6. It is a reducing agent; incompatible with all **oxidizing agents.** If it is triturated dry with powerful oxidizers, an explosion is liable to occur. It will be seen from this that tannic acid **is almost universally incompatible.**

Uses.—Astringent, hemostatic, antidote. **Dose, 0,50 Gm.**

Prep.—1. **Glyceritum acidi tannici.** (20%.)
2. **Collodium stypticum.** (20%.)
3. **Unguentum acidi tannici.** (20%.)
4. **Trochisci acidi tannici.** (0,06 Gm. each.)

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Adm.—For action in mouth, in aqueous solution (with glycerin). When action in stomach is desired, in powder (with sugar.) To reach intestine, give in pill.

ACIDUM TARTARICUM. (As'-id-um tar-tar'-ik-um.) **Acidi tartarici. Tartaric acid.**

Colorless crystals, or a white powder, odorless, and having a purely acid taste.

Sol.—0,71 of water; 1,67 of alcohol; 250 of ether; nearly insoluble in chloroform, benzene, or petroleum benzin.

Inc.—(a) Those of acids. (See acida.) Tartrates are transposed by **mineral acids.** (b) 1. Excess of tartaric acid added to rather strong solution of **potassium hydrate** or **ammonia,** gives a white precipitate of the corresponding bitartrate. 2. Tartaric acid and tartrates are capable of acting as reducing agents; reducing **silver salts, mercuric chloride, potassium permanganate, chromates.**

Uses.—Refrigerant. **Dose, 0,50 Gm.**

Adm.—With sugar; or syrup of citric acid.

ACIDUM TRICHLORACETICUM. (As'-id-um tri-klo-ras-e'-tik-um.) **Acidi trichloracetici. Trichloracetic acid.**

White, deliquescent crystals, having a slight characteristic odor.

Sol.—Very soluble in water, alcohol, and ether.

Inc.—See acida.

Uses.—Antiseptic, escharotic.

ACONITINA. (Ak-on-it-i'-nah.) **Aconitinae. Aco'nitine.**

A very poisonous alkaloid obtained from aconite.

Colorless or white rhombic tables or prisms, odorless, and producing, in extremely diluted solution, a characteristic tingling sensation when brought in contact with the mucous surfaces of the tongue or lips.

Sol.—3200 of water; 22 of alcohol; 44 of ether; 5,6 of benzene; very soluble in chloroform.

Inc.—1. The **general alkaloidal reagents.** (See alkaloids.)

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hydrolysis this is decomposed into aconine and benzoic acid.

Use.—Local analgesic, circulatory depressant. **Dose, 0,00015 Gm.**

Adm.—In pills, tablets, or solution. 1 to 2% ointment externally, provided there are no abrasions.

ACONITUM. (Ak-o-ni'-tum.) **Aconiti. Ac'onite.** Syn.—Monkshood, Wolfsbane. The dried tuberous root of *Aconitum napellus.*

Conical blackish-brown tuberous root, internally whitish or light brown; odor very slight; taste at first sweetish, soon becoming acrid, and producing a sensation of tingling and numbness, which lasts for some time.

Comp.—Aconitine (0,5% by assay), the active principle. (See aconitina.) Two other alkaloids are present: aconine and benzaconine.

Inc.—See Aconitina.

Uses.—Local analgesic, circulatory depressant.

Dose, 0,065 Gm.

Prep.—1. **Fluidextractum aconiti. Dose, 0,05 Cc.**

2. **Tinctura aconiti.** (10%.) **Dose, 0,60 Cc.**

Adm.—The tincture is the best preparation; it may be given with syrup of orange or syrup of citric acid.

ADEPS. (Ad'-eps.) **Adipis. Lard.** The prepared internal fat of the abdomen of the hog.

A soft, white, unctuous solid, having a faint odor free from rancidity, and a bland taste.

Sol.—Insoluble in water; very slightly soluble in alcohol; readily soluble in ether, chloroform, carbon disulphide, or petroleum benzin.

Comp.—Olein (60%); stearin: palmitin.

Inc.—**Alkali hydrates** or **carbonates** decompose lard, forming glycerin, and oleates, stearates, and palmitates of the alkali metal.

Uses.—Emollient.

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Oleum adipis. Lard oil. A fixed oil of pale yellow color, consisting chiefly of olein. See olea fixa.

ADEPS LANAE. (Ad'-eps la'-ne.) **Adipis lanae. Wool-fat.** The purified fat of the wool of sheep freed from water.

A light-yellowish, tenacious, unctuous mass, having a slight, peculiar odor.

Sol.—Insoluble in, but mixable with, large quantities of water; sparingly soluble in alcohol; readily soluble in ether and chloroform.

Comp.—Cholesterin and isocholesterin (70%); fatty acids (30%).

Uses.—Emollient.

ADEPS LANAE HYDROSUS. (Ad'-eps la'-ne hi-dro'-sus.) **Adipis lanae hydrosi. Hydrous wool fat.** Syn.—Lanolin.

The purified fat of the wool of sheep, mixed with not more than 30% of water.

A yellowish-white or nearly white, ointment-like mass, having a faint peculiar odor.

Sol.—Insoluble in water, but mixable with twice its weight of the latter, without losing its ointment-like consistency.

Uses.—Emollient.

AETHER. (E'-ther.) **Aetheris. Ether.** Syn.—Sulphuric ether.

A transparent, colorless mobile liquid, having a characteristic odor, and a burning, sweetish taste. Very inflammable.

Sol.—10 of water; mixable in all proportions with alcohol, chloroform, benzene, petroleum benzin, fixed and volatile oils.

Inc.—**Strong oxidizing agents** change it chemically.

Uses.—General and local anesthetic, carminative, reflex stimulant. **Dose, 1 Cc.**

Prep.—1. **Spiritus aetheris.** (32,5%.) **Dose, 4 Cc.**

2. **Spiritus aetheris compositus.** (32,5%.) **Dose, 4 Cc.**

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3. **Oleum aethereum,** used in preparation of compound spirit of ether.

Adm.—Internally, mainly as spirit of ether; which may be dropped on sugar; or mixed with compound tincture of lavender, or aromatic spirit of ammonia; to be taken in sweetened water.

AETHER ACETICUS. (E'-ther as-e'-tik-us.) **Aetheris acetici. Acetic ether.** Syn.—Ethyl acetate.

A transparent, colorless liquid, of a fragrant and refreshing, slightly acetous odor, and a peculiar acetous, and burning taste.

Sol.—7 of water; freely in alcohol or ether, fixed and volatile oils.

Inc.—**Alkaline hydroxides** decompose it.

Uses.—Like ether, but more irritating and less effective. **Dose, 1 Cc.**

AETHYLIS CARBAMAS. (Eth'-il-is kar'-bam-as.) **Aethylis carbam'atis. Ethyl carbamate.** Syn.—Urethane. Ethyl urethane.

Colorless, columnar crystals or scales; odorless, and having a saline, cooling taste.

Sol.—In less than 1 of water; 0,6 of alcohol; 1 of ether; 1,3 of chloroform; 3 of glycerin.

Inc.—1. **Acids and alkalies.** 2. Softening or liquefaction results when it is rubbed with **chloral hydrate, phenol, menthol, thymol,** etc.

Uses.—Hypnotic. **Dose, 1 Gm.**

Adm.—In aromatic water (peppermint water), with glycerin or syrup.

AETHYLIS CHLORIDUM. (Eth'-il-is klo'-rid-um.) **Aethylis chloridi. Ethyl chloride.** Syn.—Hydrochloric ether.

A colorless, mobile, very volatile liquid, having a characteristic, rather agreeable odor, and a burning taste. Boils at 12,5 to 13° C. (About 55° F.)

Sol.—Slightly in water; readily in alcohol.

Uses.—Local and general anesthetic.

Adm.—For local action, sprayed on; for general action, by inhalation.

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ALCOHOL. (Al'-ko-hol.) **Alcoho'lis. Alcohol.**

A transparent, colorless, mobile and volatile liquid of a characteristic, rather agreeable odor, and a burning taste.

Sol.—Mixable with water, ether, or chloroform.

Inc.—1. **Albumin, gums,** and **many inorganic salts** are precipitated by alcohol from their aqueous solution. 2. Alcohol is a reducing agent, and reacts violently with many **oxidizing agents.**

Uses.—Antiseptic, refrigerant, rubefacient, astringent, stomachic, carminative, reflex stimulant, narcotic, diaphoretic, diuretic.

Prep.—**Alcohol dilutum.** Diluted alcohol. Syn.—Proof spirit. (50%.)

ALCOHOL ABSOLUTUM. Al'-ko-hol ab-so-lu'-tum.) **Alcoho'lis absoluti. Ab'solute alcohol.**

Alcohol containing not more than 1% of water. Very hygroscopic.

ALKALOIDS are organic substances containing nitrogen and having alkaline properties, which uniting with acids after the manner of ammonia (without elimination of water) give well defined and usually crystalline salts.

They are mostly white, odorless, crystalline solids; with the prominent exception of those containing no oxygen (amines), which are, in most cases, volatile liquids of peculiar disagreeable odor; these form, however, crystalline salts. They have a bitter taste, which is so intense in most cases that we should avoid prescribing them in solution.

Solubility.—Most alkaloids are soluble in alcohol, ether, chloroform, and oils, and comparatively insoluble in water. On the other hand, alkaloidal salts of mineral acids, and of acetic and citric acids, are generally

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parlance, we say "quinine, strychnine, morphine," a salt of these alkaloids, usually the sulphate or the hydrochlorate, is meant. If, however, the alkaloids are to be dissolved in oils or fats, or in ethereal liquids such as collodion, the free alkaloids, and not their salts must be used.

Inc.—The following general alkaloidal reagents are of importance: 1. **Alkaline hydrates,** and **salts with alkaline reaction,** such as **carbonates, borax, sodium phosphate, potassium arsenite,** and **sodium arsenate,** precipitate alkaloids from aqueous solutions of their salts. 2. Alkaloidal salts are generally precipitated from aqueous solution combined with the following reagents: **Tannic acid, picric acid, salicylates, benzoates, bichromates, iodine, bromine, iodides, bromides, potassium mercuric iodide, mercuric chloride, gold chloride,** and **phosphomolybdic acid.** Precipitation is prevented in nearly every case by the presence of 20 to 50% of alcohol. 3. Most alkaloids are strong reducing agents; and are decomposed by **oxidizing agents,** with which many alkaloids give beautiful color reactions.

ALOE. (Al'-o.) **Aloes.** (Al'-o-ez.) **Aloes.** (Al'-oz.) The inpissated juice of the leaves of several species of **Aloe.**

Yellowish-brown to blackish-brown opaque masses, of characteristic odor and nauseous, bitter taste.

Comp.—Aloin, a neutral principle, is the chief active principle. (See aloinum). Also present: resin; trace of volatile oil.

Sol. and Inc.—See aloinum.

Uses.—Cathartic, emmenagogue. **Dose, 0,25 Gm.**

Prep.—1. **Aloe purificata. Dose, 0,25 Gm.**

2. **Extractum aloes. Dose, 0,125 Gm.**
3. **Tinctura aloes.** (10%.) **Dose, 2 Cc.**
4. **Pilulae aloes.** (0.13 Gm. in each.) **Dose, 2 pills.**
5. **Pilulae aloes et ferri.** (0,07 Gm. in each.) **Dose, 2 pills.**
6. **Pilulae aloes et mastiches.** (0,13 Gm. in each.) **Dose, 2 pills.**

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7. **Pilulae aloes et myrrhae.** (0,13 Gm. in each.) **Dose, 2 pills.**

8. **Tinctura aloes et myrrhae.** (10%.) **Dose, 2 Cc.**

Adm.—In pills, for which purpose the extract of aloes is the best preparation; liquid preparations too disagreeable.

ALOINUM. (Al-o-i'-num.) **Aloini. Al'oin.**

A neutral principle obtained from aloes.

Minute acicular crystals, lemon-yellow to yellowish-brown in color, possessing a slight odor of aloes and an intensely bitter taste.

Sol.—About 65 of water; 10,75 of alcohol; 664 of ether; 4260 of chloroform. Alkalies, their carbonates, and soap increase its solubility in water.

Inc.—1. Precipitated by **tannic acid, lead subacetate.** 2. Decomposed by solutions of **alkali hydrates, nitric acid.** 3. Green-black color with **ferric chloride**; red with **spirit of nitrous ether.**

Uses.—Cathartic, emmenagogue. **Dose, 0,065 Gm.**

Prep.—**Pilulae laxativae compositae.** (0,013 Gm. in each.) **Dose, 2 pills.**

Adm.—In pill.

ALTHAEA. (Al-the'-ah.) **Althaeae. Althaea.** Syn.—Marshmallow. The dried root of *Althaea officinalis.*

Yellowish-white wood of faint odor, and sweetish, mucilaginous taste.

Comp.—Bassorin, a mucilage (35%); sugar (8%); pectin (10%); asparagin (1%).

Uses.—Demulcent. **Dose, any quantity.**

Adm.—In decoction.

ALUMEN. (Al-u'-men.) **Aluminis. Al'um.** Syn.—Aluminum and Potassium Sulphate.

Large, colorless, octahedral crystals, without odor, but having a sweetish and strongly astringent taste.

Sol.—9 of water; insoluble in alcohol; but freely soluble in warm glycerin.

Inc.—(a) Aluminum is precipitated by **alkali hydrates,**

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their **carbonates**, their **phosphates**, **borax**, and **lime water**. **Tannic acid** causes a slight precipitation. (b) Those of sulphates. (See acidum sulphuricum.)

Uses.—Astringent. **Dose, 0,50 Gm.**

Adm.—Syrup of citric acid forms a good vehicle for it.

Prep.—**Alumen exsiccatum.** Dried alum. 100 parts reduced to 55 parts by driving off water of crystallization.

ALUMINI HYDROXIDUM. (Al-u'-min-i hi-droks'-id-um.) **Alumini hydroxidi. Aluminum hydroxide.**

A white, light, amorphous powder, odorless and tasteless.

Sol.—Insoluble in water or alcohol.

Uses.—Feebly astringent dusting powder.

ALUMINI SULPHAS. (Al-u'-min-i sul'-fas.) **Alumini sulpha'tis. Aluminum sulphate.**

A white crystalline powder, or shining plates, without odor, having a sweetish and afterwards astringent taste.

Sol.—1 of water; insoluble in alcohol.

Inc.—See Alumen.

Uses.—Antiseptic, astringent.

AMMONIA. A gas. (Unofficial.)

Inc.—1. Ammonia combines with **acids** to form salts. 2. It combines with the **halogens** (chlorine, bromine and iodine) to form corresponding salts; and sometimes produces with them explosive nitrogen combinations. 3. Precipitates solutions of salts of **mercury, lead, silver, copper, zinc, bismuth, iron, manganese, aluminum, chromium, antimony.** With **mercurous chloride** it forms a black compound. 4. With concentrated solutions of **tartaric acid** or of **picric acid** it gives precipitate. 5. Precipitates nearly all **alkaloids** from aqueous solution of their salts. 6. Decomposes **chloral.** 7. With solutions of **formaldehyde** it forms

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Prep.—1. **Aqua ammoniae.** (10%.) **Dose, 1 Cc.**
2. **Aqua ammoniae fortior.** (28%.)
3. **Spiritus ammoniae.** (10%.) **Dose, 1 Cc.**
4. **Spiritus ammoniae aromaticus** (ammonia water, 9%). **Dose, 2 Cc.**
5. **Linimentum ammoniae** (ammonia water, 35%).

Adm.—The aromatic spirit of ammonia is best suited for internal administration; it may be prescribed with aromatic elixir and should be given well diluted.

AMMONII BENZOAS. (Am-o'-ne-i ben'-zo-as). **Ammonii benzoa'tis. Ammonium benzoate.**

Thin, white, laminar crystals or a crystalline powder, odorless or having a slight odor of benzoin; of saline, bitter, afterwards slightly acrid taste.

Sol.—10,5 of water; 25 of alcohol.

Inc.—See ammonii chloridum and sodii benzoas.

Uses.—Antiseptic, expectorant, diuretic. **Dose, 1 Gm.**

Adm.—Solution in aromatic water (e. g., chloroform water), sweetened with flavoring syrup (e. g., syrup of tolu, or syrup of wild cherry).

AMMONII BROMIDUM. (Am-o'-ne-i bro'-mid-um.) **Ammonii bromidi. Ammonium bromide.**

Colorless, prismatic crystals, or a white crystalline powder; odorless, having a pungent, saline taste.

Sol.—1,2 of water; 12,5 of alcohol.

Inc.—See acidum hydrobromicum and ammonii chloridum.

Uses.—Sedative nervine. **Dose, 1 Gm.**

Adm.—Like Ammonii benzoas. See above.

AMMONII CARBONAS. (Am-o'-ne-i kar'-bon-as). **Ammonii carbona'tis. Ammonium carbonate.** Syn.—Baker's Ammonia. Hartshorn. Sal volatile.

A mixture of acid ammonium carbonate and ammonium carbamate. White, hard, translucent masses, having a strongly ammoniacal odor, and a sharp saline taste. Changes to white powder on exposure to the air.

Sol.—4 of water; alcohol dissolves the carbamate, and leaves the acid carbonate.

Inc.—Similar to potassium carbonate, with the follow-

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ing exceptions: 1. With solution of **mercuric chloride,** it gives a white precipitate of ammoniated mercury; with **calomel,** a black compound, dimercurous ammonium chloride. 2. **Copper** and **silver** salts are precipitated, but the precipitate is redissolved by excess of carbonate. Magnesium salts are not precipitated, except in concentrated solution. 3. Not as many alkaloids are precipitated, e. g. atropine, nicotine, coniine, codeine, caffeine are not precipitated by ammonium carbonate. 4. It must not be prescribed with syrup of squill, syrup of ipecac, syrup of citric acid, or other syrups of acid reaction.

Uses.—Reflex stimulant, carminative, expectorant. **Dose, 0,25 Gm.**

Prep.—**Liquor ammonii acetatis. Dose, 16 Cc.**

Adm.—Ammmonium carbonate should be prescribed with mucilage of acacia to lessen its irritant action, sweetened with syrup, and flavored with aromatics (e. g. compound tincture of lavender). Solution of ammonium acetate may be rendered more pleasant by peppermint water, sweetened with syrup.

AMMONII CHLORIDUM. (Am-o′-ne-i klo′-rid-um.) **Ammonii chloridi. Ammonium chloride.** Syn.—Sal ammoniac.

A white, crystalline powder, without odor, having a cooling, saline taste.

Sol.—2 of water; 50 of alcohol; 5 of glycerin.

Inc.—(a) of chlorides. (See acidum hydrochloricum.) (b) of ammonium. 1 **Fixed alkali hydrates** or **carbonates,** or the **hydrates of the alkali earth metals** liberate ammonia from ammonium salts. 2. With **chlorine gas,** the explosive nitrogen chloride may be formed.

Uses.—Expectorant, hepatic stimulant. **Dose, 0,50 Gm.**

Prep.—**Trochisci ammonii chloridi.** (0,10 Gm. each.)

Adm.—In aqueous solution with fluid extract of glycyrrhiza or syrup of wild cherry to disguise its taste. It may also be prescribed in form of the official lozenges. Dose should be taken with at least a wineglassful of water.

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AMMONII IODIDUM. (Am-o′-ne-i **i-od′-id-um.**) **Ammonii iodidi. Ammonium i′odide.**

Minute, colorless, cubical crystals, or a white, granular powder, very deliquescent; having a sharp, saline taste.

Sol.—0,6 of water; 9 of alcohol.

Inc.—See acidum hydriodicum and ammonii chloridum.

Uses.—Alterative. **Dose, 0,25 Gm.**

Adm.—In aqueous solution with flavoring syrup, e. g., syrup of orange.

AMMONII SALICYLAS. (Am-o′-ne-i sal-is′-il-as.) **Ammonii salicyla′tis. Ammonium salicylate.**

Colorless, lustrous crystals or plates, or a white, crystalline powder; odorless, and having at first a slightly saline, bitter taste, with a sweetish aftertaste.

Sol.—0,9 of water; 2,3 of alcohol.

Inc.—See ammonii chloridum and acidum salicylicum.

Uses.—Antiseptic, cholagogue, antirheumatic. **Dose, 0,25 Gm.**

Adm.—In sweetened aromatic water.

AMMONII VALERAS. (Am-o′-ne-i val-e′-ras.) **Ammonii valera′tis. Ammonium val′erate.** Colorless, or white, quadrangular plates, emitting the odor of valeric acid, of a sharp and sweetish taste, and deliquescent in moist air.

Sol.—Very soluble in water and in alcohol; also soluble in ether.

Inc.—(a) those of ammonium. (See ammonii chloridum.) (b) **Sulphuric acid** added to concentrated aqueous solution liberates valeric acid, which forms an oily layer on the surface.

Uses.—Antispasmodic, antihysteric. **Dose, 0,50 Gm.**

Adm.—In aromatic elixir.

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within; taste bitter, with flavor of oil of bitter almond.

Comp.—A fixed oil, 45%, which when separated forms expressed oil of almond, (oleum amygdalae expressum, q. v.). Amygdalin, a glucoside, and emulsin, a ferment, are also present, which, in the presence of water, react with each other, yielding oil of bitter almond. (See below.)

Uses.—Flavoring agent.

Prepared from bitter almond by maceration with water and subsequent distillation:

Oleum amygdalae amarae, a volatile oil which should yield, when assayed, not less than 85% of benzaldehyde, and not less than 2% nor more than 4% of hydrocyanic acid. **Dose, 0,03 Cc.**

Prep.—1. **Aqua amygdalae amarae.** (0.1%.) **Dose, 4 Cc.**
2. **Spiritus amygdalae amarae.** (1%.) **Dose, 0,5 Cc.**
3. **Syrupus amygdalae.** (Spirit 1%.) **Dose, 4 Cc.**

AMYGDALA DULCIS. (Am-ig'-dal-ah dul'-sis.) **Amygdalae dulcis. Sweet almond.** The ripe seed of *Prunus amygdalus*, var. *dulcis.*

Closely resembles bitter almond (see above), but has a bland, sweetish taste.

Comp.—A fixed oil (56%), which when separated forms expressed oil of almond (oleum amygdalae expressum.) There is also emulsin; but no amygdalin.

Uses.—Demulcent, nutritive.

Prep.—**Emulsum amygdalae.** (6%.) **Dose, 120 Cc.**

AMYLIS NITRIS. (Am'-il-is ni'-tris.) **Amylis nitri'tis. Amyl nitrite.**

A clear, yellowish liquid, of a peculiar, ethereal, fruity odor, and a pungent, aromatic taste.

Sol.—Almost insoluble in water; mixable with alcohol, ether, or chloroform.

Inc.—It is decomposed by **potassium hydrate,** slowly by

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AMYLUM. (Am′-il-um.) **Amyli. Starch.**

Fine white powder, or angular masses, odorless and tasteless.

Sol.—Insoluble in cold water or alcohol.

Uses.—Dusting powder, demulcent, nutritive.

Prep.—**Glyceritum amyli.** (10%.)

ANISUM. (An-i′-sum.) **Anisi. An′ise.** The ripe fruit of *Pimpinella anisum.*

Small, oval, greenish-gray to grayish-brown; odor and taste agreeable and aromatic.

Comp.—Volatile oil.

Uses.—Carminative, flavoring. **Dose, 0,50 Gm.**

Prepared from it by distillation:

Oleum anisi. For sol. and inc. see olea volatilia. **Dose, 0,2 Cc.**

Prep.—1. **Aqua anisi.** (0.2%.) **Dose, 16 Cc.**

2. **Spiritus anisi.** (10%.) **Dose, 4 Cc.**

ANTHEMIS. (An′-them-is.) **Anthem′idis. Anthemis.** Syn.—Chamomile.

The dried flower heads of *Anthemis nobilis.* Expanded compound flower head, subglobular, about 2 cm. broad; numerous white florets, and few yellow disk florets. Odor agreeable; taste strongly aromatic and bitter.

Comp.—Volatile oil, bitter principle, etc.

Uses.—Carminative, diaphoretic. **Dose, 2 Gm.**

Adm.—In infusion.

ANTIMONII ET POTASSII TARTRAS. (An-te-mo′-ne-i et po-tas′-e-i tar′-tras.) **Antimonii et potassii tartra′tis. Antimony and potassium tartrate.** Syn. Tartar emetic.

Colorless crystals, or a white, granular powder; odorless, having a sweet, afterwards disagreeable, metallic taste.

Sol.—15,5 of water; insoluble in alcohol.

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e. g., lead acetate, silver nitrate. Mercuric chloride, in aqueous solution, is reduced to mercurous chloride. 4. Precip. by **tannic acid, gallic acid,** and astringent infusions. 5. **Albumin,** and **soap** give precipitates.

Uses.—Expectorant, **dose, 0,005 Gm.** Emetic, **dose, 0,030 Gm.**

Prep.—1. **Vinum antimonii.** (0.4%.) **Dose, 1 Cc.**

2. **Syrupus scillae compositus.** (0.2%.) **Dose, 2 Cc.**

Adm.—In pill (with sugar of milk); or, in form of one of its preparations, with flavoring syrup, e. g., syrup of tolu.

ANTIPYRINA. (An-te-pi-ri'-na.) **Antipyrinae. Antipy'rine.** Syn. Phenazonum.

A colorless, almost odorless, crystalline powder or tabular crystals, with a slightly bitter taste.

Sol.—1 of water, 1 of alcohol, 1 of chloroform, 30 of ether.

Inc.—Antipyrine is **almost universally incompatible.**

Uses.—Haemostatic, antipyretic, analgesic. **Dose, 0,25 Gm.**

Adm.—In aromatic water (e. g., peppermint water), sweetened with flavoring syrup (e. g., syrup of orange). May also be given in powders or capsules.

APOCYNUM. (Ap-os'-in-um.) **Apocyni. Apocynum.** Syn.—Canadian hemp. The dried rhizome of *Apocynum cannabinum,* or of closely allied species of Apocynum.

Long, woody roots, with thick gray bark; almost inodorous; taste starchy, afterwards becoming bitter and somewhat acrid.

Comp.—Apocynein, a water-soluble glucoside with digitalis action; apocynin, an amorphous, resinous glucoside; tannin, etc.

Uses—Heart stimulant, diuretic. **Dose, 1 Gm.**

Prep.—**Fluidextractum apocyni. Dose, 1 Cc.**

APOMORPHINAE HYDROCHLORIDUM. (Ap-o-mor-fi'-ne

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ing a greenish tint on exposure to light and air. It is odorless, and has a faintly bitter taste.

Sol.—39,5 of water; 38,2 of alcohol; 1864 of ether; 3800 of chloroform.

Inc.—1. The general **alkaloidal precipitants.** (See alkaloida.) 2. Color reactions. With **ferric chloride** (red precipitate, turning black); with concentrated **nitric acid** (red.) 3. It is a reducing agent, incompatible with **oxidizers.**

Uses.—Expectorant, **dose, 0,002 Gm.**; emetic, **dose, 0,005 Gm.**

Adm.—Aqueous solution flavored with syrup of wild cherry or syrup of citric acid; or in pill, or capsule. As emetic hypodermically.

AQUAE. See p. 77.

AQUA HYDROGENII DIOXIDI. (A'-kwah hi-dro-ge'-ne-i di-oks'-id-i.) **Aquae hydrogenii dioxidi. Solution of hydrogen dioxide.** Syn.—Solution of hydrogen peroxide.

A colorless, odorless liquid, slightly acidulous to the taste, and producing a peculiar sensation and soapy froth in the mouth. It contains about 3% of the pure dioxide, corresponding to about 10 volumes of available oxygen. It should be kept tightly corked in a cool place.

Inc.—Hydrogen dioxide is a powerful oxidizing agent, and is **almost universally incompatible.**

Uses.—Antiseptic; cleansing agent. **Dose, 4 Cc.**

Adm.—Generally diluted with 1 to 3 parts of water; may be sweetened with glycerin.

ARGENTI CYANIDUM. (Ar-jen'-ti si-an'-id-um.) **Argenti cyanidi. Silver cy'anide.**

A white, odorless and tasteless, insoluble powder. Used for the extemporaneous preparation of diluted hydrocyanic acid. **Dose, 0,002 Gm.**

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Colorless, transparent, tabular, rhombic crystals, odorless, but having a bitter, caustic, and strongly metallic taste.

Sol.—0,54 of water; 24 of alcohol.

Inc.—Precipitated by **alkalies** and their **carbonates,** and by all **acids** or **their salts,** excepting nitric and acetic acids. 2. It is easily reduced; hence incompatible with **reducing agents,** including **organic substances** in general.

Uses.—Antiseptic, astringent, caustic. **Dose, 0,01 Gm.**

Adm.—As lotion, 1/10 to 2%; as pigment, 2 to 10% (in distilled water). For action on stomach in pill, with kaolin as diluent and petrolatum as excipient; for action on bowel in keratin coated pill.

Prep.—1. **Argenti nitras fusus.** In form of pencils.

2. **Argenti nitras mitigatus.** Mitigated silver nitrate. Contains silver nitrate (33.3%) with potassium nitrate.

ARGENTI OXIDUM. (Ar-jen'-ti oks'-id-um.) **Argenti oxidi. Silver oxide.** A heavy, dark brownish-black powder, odorless and having a metallic taste.

Sol.—Very slightly soluble in water; insoluble in alcohol.

Inc.—Silver oxide parts readily with its oxygen, forming explosive compounds with **many substances.**

Uses.—A very feeble astringent. **Dose, 0,065 Gm.**

Adm.—In pill, prescribed like silver nitrate. (See above.)

ARNICA. (Ar'-nik-ah.) **Arnicae. Arnica.** The dried flower-heads of *Arnica montana.* A compound flower head with 15 to 20 yellow ray-florets and many disc florets with pappus; odor characteristic and agreeable; taste bitter.

Comp.—Arnicin, a yellow, acrid bitter principle, soluble in alcohol or ether; volatile oil; resin; tannic acid, etc.

Uses.—Externally in lotions. **Dose, 1 Gm.**

Prep.—**Tinctura arnicae.** (20%.) **Dose, 1 Cc.**

ARSENI IODIDUM. (Ar'-sen-i i-od'-id-um.) **Arseni iodidi. Arsenic iodide.**

An orange-red, crystalline, odorless powder.

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Sol.—12 of water; 28 of alcohol; completely soluble in chloroform, ether, carbon disulphide.

Inc.—See acidum hydriodicum and arseni trioxidum.

Uses.—Alterative. **Dose, 0,005 Gm.**

Prep.—**Liquor arseni et hydrargyri iodidi.** (1%.) **Dose, 0,1 Cc.**

Adm.—In pill (with sugar of milk). The solution of arsenous and mercuric iodides is best prescribed in distilled water; this solution precipitates alkaloids, the precipitate being heavy and poisonous, therefore dangerous.

ARSENI TRIOXIDUM. (Ar'-sen-i tri-oks'-id-um.) **Arseni trioxidi. Arsenic trioxide.** Syn.—Arsenous acid. White arsenic.

A heavy, white solid, odorless, and almost tasteless.

Sol.—30 to 100 of water; freely in hydrochloric acid and in alkaline solutions.

Inc.—1. The soluble arsenites (generally not the free acid) precipitate **neutral solutions of nearly all metallic salts,** except those of the alkali metals; e. g., with ferric hydrate, or dialysed iron; with **mercuric chloride**; also with **lime water**; with **magnesia.** 2. With solution of **potassium iodide** liable to yield a precipitate. 3. With **tannic acid** a white, later-greenish precipitate. 4. Reduced to arsenic by **hypophosphites** in acid mixture. 5. Arsenous compounds are changed to arsenic compounds by **oxidizing agents.**

Uses.—Caustic, tonic, alterative, hematinic. **Dose, 0,002 Gm.**

Prep.—1. **Liquor potassii arsenitis.** (1%.) **Dose, 0,2 Cc.** This solution is alkaline in reaction, and may precipitate solutions of alkaloidal and metallic salts.

2. **Liquor acidi arsenosi.** (1%.) **Dose, 0,2 Cc.** Has acid reaction.

Adm.—Best in pill or tablet (with sugar of milk); unless it is necessary to give ascending dose, when one of the solutions should be used. The best liquid preparation is solution of potassium arsenite, which may be

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given in drop doses, or prescribed with aromatic water, e. g., peppermint water, and syrup. The solution of arsenous acid should be used if combination with tincture of ferric chloride or alkaloidal salts is desired. For combination with oxidizing agents use liquor sodii arsenatis (q. v.).

ASAFOETIDA. (As-a-fet'-id-ah.) **Asafoetidæ. Asafetida.** A gum-resin obtained from the root of *Ferula foetida.*

A yellowish-brown or reddish-brown mass, containing embedded whitish tears; odor persistent, alliaceous; taste bitter, alliaceous, and acrid.

Comp.—A volatile oil (5%); gum (25%); bassorin resin (65%.)

Sol.—Trituration with water produces milk-white emulsion. Not less than 50% should dissolve in alcohol.

Uses.—Carminative, antispasmodic, antihysteric. **Dose, 0,25 Gm.**

Prep.—1. **Emulsum asafoetidæ.** (4%.) **Dose, 16 Cc.**
2. **Tinctura asafoetidæ.** (20%.) **Dose, 1 Cc.**
3. **Pilulae asafoetidae.** (0,20 Gm. in each.) **Dose, 2 pills.**

Adm.—In pills; suppositories; or emulsion as enema.

The tincture may be rendered somewhat less disagreeable by prescribing it with compound tincture of lavender and aromatic spirit of ammonia.

ASPIDIUM. (As-pid'-e-um.) **Aspidii. Aspidium.** Syn.—Male fern. The dried rhizome of *Dryopteris filix-mas* and of *Dryopteris marginalis.*

A thick, fleshy dark-brown rhizome, thickly beset with the bases of stipes; odor disagreeable; taste bitter-sweet, astringent, acrid, and nauseous.

Comp.—Filicic acid, probably the active principle; a number of neutral bodies, chief of which is aspidin; a volatile oil; a fixed oil; resin; filix-red, etc.

Uses.—Anthelmintic against tape-worm. **Dose, 4 Gm.**

Prep.—**Oleoresina aspidii. Dose, 2 Gm.**

Adm.—Oleoresin in capsules, or in emulsion.

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ATROPINA. (At-ro-pi'-nah.) **Atropinæ. Atropine.** An alkaloid obtained from *Atropa belladonna* and from other plants of the same family.

White, rhombic prisms, odorless, and possessing a bitter acrid taste.

Sol.—450 of water; 1.46 of alcohol: 16.6 of ether; 1.56 of chloroform.

Inc.—By continued **heating** with **alkali hydrates, acids,** or even with **water,** atropine is decomposed into tropine and tropic acid. 2. It is precipitated by the **general alkaloidal precipitants.** 3. The alkaloid is precipitated from concentrated aqueous solutions of its salts by **alkali hydrates** and **carbonates of fixed alkalies**; but not by ammonium carbonate or the bicarbonates.

Uses.—Local anodyne, mydriatic, antispasmodic, antisecretory, circulatory and respiratory stimulant. **Dose, 0,0004 Gm.**

Prep.—**Oleatum atropinæ.** (2%.)

Adm.—Generally in form of sulphate, (see below), as the latter is much more soluble in water.

ATROPINAE SULPHAS. (At-ro-pi'-ne sul'-fas.) **Atropinæ sulpha'tis. Atropine sulphate.**

A white crystalline powder, odorless, having a very bitter, nauseating taste.

Sol.—0.38 of water; 3.7 of alcohol; 2149 of ether; 620 of chloroform.

Inc. and uses. See atropina. **Dose, 0,0004 Gm.**

Adm.—In pill form (with sugar of milk): or in aqueous solution, flavored with syrup, e. g., of orange. Hypodermically or as collyrium in aqueous solution.

AURANTII AMARI CORTEX. (Aw-ran'-she-i am-a'-ri kor'-teks.) **Aurantii amari corticis. Bitter orange peel.** The dried rind of the unripe fruit of *Citrus vulgaris.*

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Comp.—A volatile oil; three glucosides, hesperidin, isohesperidin, and aurantiamarin, (the bitter principle.)
Inc.—Iron salts.
Uses.—Flavoring agent, stomachic. **Dose, 1 Gm.**
Prep.—1. **Fluidextractum aurantii amari. Dose, 1 Cc.**
2. **Tinctura aurantii amari.** (20%.) **Dose, 4 Cc.**

AURANTII DULCIS CORTEX. (Aw-ran′-she-i dul′-sis kor′-teks.) **Aurantii dulcis corticis. Sweet orange peel.** The recently separated outer rind of the ripe fruit of *Citrus aurantium.*
Outer surface orange-yellow; inner surface white; odor highly fragrant; taste pungently aromatic.
Comp.—As of bitter orange peel; but much less of the bitter principle.
Inc.—Iron salts.
Uses.—Flavoring agent. **Dose, 1 Gm.**
Prep.—1. **Tinctura aurantii dulcis** (50%.) **Dose, 4 Cc.**
2. **Syrupus aurantii** (Tincture 5%). **Dose, any quantity.**
Prepared from fresh sweet orange peel by distillation:
Oleum aurantii corticis, a volatile oil. **Dose, 0,2 Cc.**
Prep.—1. **Spiritus aurantii compositus** (20%).
2. **Elixir aromaticum.** (Compound spirit of orange, 1.2%.)

AURI ET SODII CHLORIDUM. (Aw′-ri et so′-de-i klo′-rid-um.) **Auri et sodii chloridi. Gold and sodium chloride.**
An orange-yellow powder, odorless, having a saline and metallic taste.
Sol.—Very soluble in water; at least one-half soluble in alcohol.
Inc.—Precipitates **potassium iodide, albumen,** and many **alkaloids.** 2. Reduced to metallic gold by **reducing agents.**

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BALSAMUM PERUVIANUM. (Bal′-sam-um pe-ru-ve-a′-num.) **Balsami peruviani. Balsam of peru′.** A balsam obtained from *Toluifera pereirae.*

A viscid liquid of dark-brown color; of an agreeable vanilla-like odor; and a bitter· acrid taste, leaving a persistent after-taste.

Comp.—A volatile oil (about 60%); resin (about 32%); cinnamic acid, etc.

Sol.—Almost insoluble in water; 5 of alcohol; mixable with absolute alcohol, chloroform, or glacial acetic acid; only partially soluble in ether and petroleum benzin.

Uses.—Antiseptic, parasiticide, rubefacient, expectorant. **Dose, 1 Gm.**

BALSAMUM TOLUTANUM. (Bal′-sam-um to-lu-ta′-num.) **Balsami tolutani. Balsam of tolu′.** A balsam obtained from *Toluifera balsamum.*

A yellowish-brown solid, having an agreeable odor recalling that of vanilla, but distinct from it, and a mild, aromatic taste.

Comp.—Volatile oils, resins, benzoic acid, cinnamic acid, etc.

Uses.—Flavoring agent, expectorant. **Dose, 1 Gm.**

Prep.—1. **Tinctura tolutana.** (20%.) **Dose, 2 Cc.**

2. **Syrupus tolutanus.** (Tincture, 5%.) **Dose, 16 Cc.**

BELLADONNAE FOLIA. (Bel-ah-don′-e fo′-le-ah.) **Belladonnae folio′rum. Belladonna leaves.** The dried leaves of *Atropa Belladonna.*

Broadly ovate, thin, smooth leaves, with entire margin, usually of dull brownish-green color; distinctly narcotic odor; somewhat bitter and acrid taste.

Comp.—Alkaloids, not less than 0,35% on assay, chief of which is atropine. (See atropina.) Belladonnine is probably identical with hyoscyamine. These alkaloids exist as malates in the plant.

Inc.—See Atropina.

Uses.—Local anodyne, mydriatic, antispasmodic, antisecretory, circulatory and respiratory stimulant. **Dose, 0,065 Gm.**

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Prep.—1. **Extractum belladonnae foliorum. Dose, 0,01 Gm.**
2. **Tinctura belladonnae foliorum.** (10%.) **Dose, 0,5 Cc.**
3. **Unguentum belladonnae.** (Extract, 10%.)
4. **Emplastrum belladonnae.** (Extract, 30%.)

Adm.—The tincture is the best preparation for internal use, it may be prescribed with peppermint water, and glycerin, or syrup of orange.

BELLADONNAE RADIX. (Bel-ah-don′-e ra′-dix.) **Belladonnae radi′cis. Belladonna root.** The dried root of *Atropa Belladonna.*

Slender, light grayish-brown roots; nearly inodorous; taste sweetish, afterward bitterish and strongly acrid.

Comp.—As of the leaves; excepting that there should be not less than 0,5% of alkaloids on assay.

Inc. and Uses.—See above. **Dose, 0,045 Gm.**

Prep.—1. **Fluidextractum belladonnae radicis. Dose, 0,05 Cc.** 2. **Linimentum belladonnae.** (Fluidextract 95%.)

BENZALDEHYDUM. (Ben-zal-de-hi′-dum.) **Benzaldehydi. Benzal′dehyde.** Syn.—Benzoic aldehyde. An aldehyde, produced synthetically, or obtained from natural oil of bitter almond or other oils.

A colorless, strongly refractive liquid, having a bitter-almond-like odor, and a burning, aromatic taste.

Sol.—Sparingly in water; soluble, in all proportions, in alcohol, ether, and fixed and volatile oils.

Inc.—1. Readily oxidized by **air** and by **oxidizing agents** to benzoic acid. 2. With **potassium hydrate** it forms potassium benzoate and benzyl alcohol. 3. With **ammonia water,** forms hydrobenzamid. 4. With **chlorine,** benzoyl chloride is produced.

Uses.—Flavoring agent, superior to natural oil of bitter almond because of uniformity of composition and freedom from hydrocyanic acid. **Dose, 0,03 Cc.**

BENZINUM. (Ben-zi′-num.) **Benzini. Petroleum ben′zin.** Syn.—Petroleum ether.

A transparent, colorless liquid, of a strong characteristic odor.

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Sol.—Insoluble in water; 6 of alcohol; readily soluble in ether, chloroform, benzene, volatile oils, and fixed oils with the exception of castor oil.

Uses.—Solvent in pharmacy.

Prep.—**Benzinum purificatum.**

BENZOINUM. (Ben-zo-i'-num.) **Benzoini. Ben'zoin.** A balsamic resin obtained from *Styrax benzoin.*

A brown solid with whitish tears embedded in it; odor agreeable, balsamic; taste slightly acrid.

Comp.—Benzoic acid (12 to 20%); resin; volatile oil.

Sol.—Insoluble in water; 5 of warm alcohol; also soluble in solutions of potassium or sodium hydroxide.

Inc.—See acidum benzoicum.

Uses.—Antiseptic, irritant, expectorant, diuretic. **Dose, 1 Gm.**

Prep.—1. **Tinctura benzoini.** (20%.) **Dose, 1 Cc.**
2. **Tinctura benzoini composita.** (10%.) **Dose, 2 Cc.**
3. **Adeps benzoinatus.** (2%.)

Adm.—The tincture may be prescribed with strongly alcoholic preparations; or else emulsified with acacia.

BENZOSULPHINIDUM. (Ben-zo-sul-fin-i'-dum.) **Benzosulphinidi. Benzosul'phinide.** Syn.—Saccharin. Gluside.

A white, crystalline powder, nearly odorless, and having an intensely sweet taste even in dilute solution. Its sweetening power is about 300 times greater than that of cane sugar.

Sol.—250 of water; 25 of alcohol; but slightly soluble in ether or chloroform. Easily soluble in ammonia water, in alkaline hydroxide solutions, and in a solution of sodium bicarbonate, with the evolution of carbon dioxide.

Uses.—Sweetening agent, antiseptic. **Dose, 0,20 Gm.**

Adm.—In food; in glycerin solution; in pills; or in tablets.

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Comp.—The alkaloids berberine (2,5%), and oxycanthine (2,8%), there is also tannic acid.

Uses.—Bitter stomachic, cholagogue laxative. **Dose, 2 Gm.**

Prep.—**Fluidextractum berberidis. Dose, 2 Cc.**

BETANAPHTHOL. (Be-tah-naf'-tol.) **Betanaphtholis. Betanaphthol.** Syn.—Naphthol.

Colorless, or pale buff-colored, shining laminae, or a crystalline powder, having a faint phenol-like odor, and a sharp and pungent, but not persistent taste.

Sol.—950 of water; 0,61 of alcohol; very soluble in ether, chloroform, and solutions of the alkali hydroxides.

Inc.—1. Softening or liquefaction occur when betanaphthol is triturated with **phenol, menthol, borneol, camphor, antipyrine,** or **ethyl carbamate.** 2. **Oxidizing agents.**

Uses.—Antiseptic. **Dose, 0,25 Gm.**

Adm.—Best in capsules, or pills.

BISMUTHI CITRAS. (Biz-mu'-thi si'-tras.) **Bismuthi citra'tis. Bis'muth citrate.**

A white, amorphous or micro-crystalline powder, odorless and tasteless.

Sol.—Insoluble in water or alcohol; soluble in ammonia water, and in solutions of alkali citrates.

Uses.—Mild antiseptic and astringent. **Dose, 0,125 Gm.**

Prep.—**Bismuthi et ammonii citras;** pearly scales, very soluble in water; sparingly soluble in alcohol.

Inc.—1. Precipitated from solution by acids. 2. Ammonia liberated by fixed alkali hydrates. **Dose, 0,125 Gm.**

Adm.—In sweetened aromatic water.

BISMUTHI SUBCARBONAS. (Biz-mu'-thi sub-kar'-bon-as.) **Bismuthi subcarbona'tis. Bismuth subcarbonate.**

A white or pale yellowish-white powder, of somewhat varying chemical composition, odorless and tasteless.

Sol.—Insoluble in water or alcohol.

Inc.—Decomposed by **nitric or hydrochloric acid,** with copious effervescence.

Uses.—Mild antiseptic and astringent. **Dose, 0,50 Gm.**

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Adm.—See bismuthi subnitras. The subcarbonate may be prescribed in liquid mixture with alkali bicarbonates.

BISMUTHI SUBGALLAS. (Biz-mu'-thi sub-gal'-as.) **Bismuthi subgalla'tis. Bismuth subgallate.** Syn.—Dermatol.

An amorphous, bright yellow powder, somewhat variable in chemical composition and without odor or taste.

Sol.—Insoluble in water, alcohol, or ether.

Inc.—Decomposed by **strong acids,** with liberation of gallic acid.

Uses.—Mild antiseptic and astringent. **Dose, 0,25 Gm.**

Adm.—See bismuthi subnitras.

BISMUTHI SUBNITRAS. (Biz-mu'-thi sub-ni'-tras.) **Bismuthi subnitra'tis. Bismuth subnitrate.**

A heavy, white powder, of somewhat varying chemical composition, odorless and almost tasteless.

Sol.—Almost insoluble in water and insoluble in alcohol.

Inc.—1. It is dissolved by **nitric** or **hydrochloric acid.** 2. Solutions of **alkali carbonates** and **bicarbonates** convert it into the subcarbonate; some carbon dioxide being liberated at the same time. 3. Soluble **iodides** change it to an iodide (yellow to red); **tannic acid** to tannate (yellow). 4. **Hypophosphites** reduce it to a black compound; **chlorine** and **chlorinated lime** in alkaline mixture, convert it into reddish peroxide.

Uses.—Mild antiseptic and astringent. **Dose, 0,50 Gm.**

Adm.—Best prescribed in powders or capsules. May be ordered suspended in aromatic water (e. g., peppermint water) by means of mucilage, preferably mucilage of tragacanth.

BISMUTHI SUBSALICYLAS. (Biz-mu'-thi sub-sal-is'-il-as.) **Bismuthi subsalicyla'tis. Bismuth subsalicylate.**

A white, or nearly white, amorphous or crystalline powder, odorless and tasteless.

Sol.—Almost insoluble in water.

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Uses.—Mild antiseptic and astringent. **Dose, 0,25 Gm.**
Adm.—See bismuthi subnitras.

BROMOFORMUM. (Bro-mo-for'-mum.) **Bromoformi. Bromoform.**
A heavy, transparent, colorless, mobile liquid, with an etheral odor and a penetrating, sweet taste resembling that of chloroform.
Sol.—Slightly in water, but soluble in all proportions in alcohol, ether, benzene, petroleum benzin and fixed and volatile oils; also soluble in glycerin.
Inc.—**Potassium hydrate** converts it into a bromide and a formate of potassium.
Uses.—Sedative (in whooping-cough). **Dose, 0,2 Cc.**
Adm.—It may be dropped on sugar (1 drop equals about 0,01 Cc.), or into aromatic water; or emulsified like chloroform (see emulsum chloroformi); or as solution, in alcohol and glycerin (flavored with aromatic spirit, e. g., spirit of peppermint); or in capsules.

BROMUM. (Bro'-mum.) **Bromi. Bromine.**
A brownish-red fuming liquid of suffocating odor.
Sol.—28 of water; readily in alcohol, ether, chloroform, carbon disulphide, and in solutions of bromides.
Inc.—Bromine is a powerful oxidizing agent, and **almost universally incompatible.**
Uses.—Caustic.

BUCHU. (Bu'-ku.) **Buchu. Buchu.** The dried leaves of *Barosma betulina.*
Rather small, roundish, yellowish-green, thick leaves, margin crenate or serrate, with a gland at each serration; odor strong, characteristic; taste somewhat mint-like, pungent and bitterish.
Comp.—Volatile oil, its main active principle; diosphenol, a stearopten; barosmin, a glucoside; rutin, a bitter principle; mucilage, etc.
Inc.—1. **Water** forms a copious precipitate with fluidextract. 2. Decomposes **spirit of nitrous ether** with evolution of gas, consisting of oxides of nitrogen.
Uses.—Diuretic, diaphoretic, expectorant. **Dose, 2 Gm.**

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Prep.—**Fluidextractum buchu. Dose, 2 Cc.**

Adm.—Fluidextract, to be freely diluted with water just before taking; or infusion.

CAFFEINA. (Ka-fe-i'-nah.) **Caffeinae. Caffeine.** Syn.—Theine. Guaranine. A feebly basic substance obtained from tea or coffee, found also in other plants.

White, flexible, silky needles, usually matted together in fleecy masses, without odor, having a bitter taste.

Sol.—45,6 of water; 53,2 of alcohol; 375 of ether; 8 of chloroform. The solubility of caffeine in water is greatly increased by the presence of sodium salicylate, sodium benzoate, or antipyrine.

Inc.—1. Caffeine unites with concentrated acids; these salts are, however, easily decomposed by water, alcohol, or ether. 2. Caffeine is not precipitated from moderately dilute solutions by the general alkaloidal precipitants, excepting **tannic acid, mercuric chloride,** and **phosphomolybdic acid,** which precipitate it.

Uses.—Stimulant to heart and to central nervous system; diuretic. **Dose, 0,065 Gm.**

Adm.—See caffeine citrate.

CAFFEINA CITRATA. (Ka-fe-i'-nah si-tra'-ta.) **Caffeinae citratae. Cit'rated caff'eine.**

A white powder, odorless, having a purely acid taste and an acid reaction.

Sol.—4 of hot water, upon dilution caffeine is precipitated until 25 of water have been added; also soluble in a mixture of equal volumes of chloroform and alcohol.

Inc. and Uses.—See caffeina. **Dose, 0,125 Gm.**

Prep.—**Caffeina citrata effervescens.** (4%.) **Dose, 4 Gm.**

Adm.—In powders, capsules, or pills. May be prescribed dissolved in syrup citric acid (4 Cc.) and chloroform water (15 Cc.). For hypodermic use, prescribe caffeine sodio-benzoate (caffeinae sodio-benzoas, N. F.), which contains 50% of caffeine, and is soluble in 2 parts of water.

CALAMUS. (Kal'-am-us.) **Calami. Calamus.** Syn.—Sweet flag. The unpeeled dried rhizome of *Acorus Calamus.*

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Flattish-cylindrical, reddish-brown, with root scars in wavy lines on the under side; internally whitish. It has an aromatic odor; and a pungent, bitter taste.

Comp.—Volatile oil (1 to 2%); acorin, a bitter glucoside; calamine, an alkaloid; etc.

Uses.—Aromatic bitter. **Dose, 1 Gm.**

Prep.—**Fluidextractum calami. Dose, 1,0 Cc.**

CALCII BROMIDUM. (Kal'-se-i bro'-mid-um.) **Calcii bromidi. Calcium bromide.**

A white, granular salt, odorless, and having a sharp, saline taste; very deliquescent.

Sol.—0,5 of water; 1 of alcohol.

Inc.—See calcii chloridum and acidum hydrobromicum.

Uses.—Sedative nervine. **Dose, 1 Gm.**

Adm.—See potassii bromidum.

CALCII CARBONAS PRAECIPITATUS. (Kal'-se-i kar'-bon-as pre-sip-it-a'-tus.) **Calcii carbona'tis praecipitati. Precip'itated calcium carbonate.**

A fine, white powder, odorless and tasteless.

Sol.—Nearly insoluble in water; the solubility is increased by the presence of ammonium salts, and especially by carbon dioxide.

Inc.—**Nearly all acids** decompose calcium carbonate, driving off the carbon dioxide.

Uses.—Absorbent, antacid, feebly astringent. **Dose, 1 Gm.**

Adm.—In powder.

CALCII CHLORIDUM. (Kal'-se-i klo'-rid-um.) **Calcii chloridi. Calcium chloride.**

White, slightly translucent, hard fragments, odorless, having a sharp saline taste, it is very deliquescent.

Sol.—1,3 of water; 8 of alcohol.

Inc.—1. Solutions of calcium salts are precipitated by the **fixed alkali hydrates** (if concentrated), by soluble **carbonates, sulphates, phosphates, oxalates, tartrates,** or **citrates.**

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CALCII HYPOPHOSPHIS. (Kal'-se-i hi-po-fos'-fis.) **Calcii hypophosphi'tis. Calcium hypophosphite.**

Colorless crystals, or white, crystalline powder, having a nauseous and bitter taste.

Sol.—6,5 of water; insoluble in alcohol.

Inc.—See calcii chloridum and Acidum hypophosphorosum. Excess of sugar throws calcium hypophosphite out of solution.

Uses.—Tonic. **Dose, 0,50 Gm.**

Prep.—1. **Syrupus hypophosphitum.** (4,5%.) **Dose, 8 Cc.** 2. **Syrupus hypophosphitum compositus.** (3,5%.) **Dose, 8 Cc.**

Adm.—In sweetened aqueous solution.

CALCII PHOSPHAS PRAECIPITATUS. (Kal'-se-i fos'-fas pre-sip-it-a'-tus.) **Calcii phospha'tis praecipitati. Precipitated calcium phosphate.**

A light, white, amorphous powder, odorless, and tasteless.

Sol.—Almost insoluble in water; insoluble in alcohol.

Inc.—Soluble compounds are formed with **nearly all acids,** except those which precipitate calcium.

Uses.—As restorative in conditions of calcium deficiency. **Dose, 1 Gm.**

Prep.—**Syrupus calcii lactophosphatis. Dose, 8 Cc.**

Adm.—In powder.

CALCII SULPHAS EXSICCATUS. (Kal'-se-i sul'-fas ek-sik-a'-tus.) **Calcii sulpha'tis exsiccati. Dried calcium sulphate.** Syn.—Dried gypsum. Plaster of Paris.

An amorphous, white powder, without odor or taste. When mixed with half its weight of water it forms a smooth paste which rapidly hardens.

Sol.—378 of water; insoluble in alcohol.

Uses.—For making immovable bandages.

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Comp.—Calendulin, which is considered to be analogous to bassorin; an amorphous bitter principle; gum.

Uses.—Vulnerary, tonic. **Dose, 1 Gm.**

Prep.—**Tinctura calendulae.**, (20%.)

CALUMBA. (Kal-um'-bah.) **Calumbae. Calumba.** Syn.—Columbo. The dried root of *Jateorhiza palmata.*

Circular transverse sections of a large fleshy root, externally greenish-brown, yellowish on cut surfaces; odor slight; taste mucilaginous, slightly aromatic, very bitter.

Comp.—Calumbin, a neutral bitter principle; berberine, a yellow alkaloid; calumbic acid; starch.

Uses.—Simple bitter stomachic. **Dose, 2 Gm.**

Prep.—1. **Fluidextractum calumbae. Dose, 2 Cc.**

2. **Tinctura calumbae.** (20%.) **Dose, 4 Cc.**

Adm.—May be prescribed with acids, or alkalies, or with iron preparations (as no tannic acid is present).

CALX. (Kalks.) **Calcis. Lime.** Calcium oxide. Syn.—Burned lime.

Hard, white or grayish-white masses; odorless, and having a sharp, caustic taste.

Sol.—760 of water; insoluble in alcohol.

Inc.—1. Exposed to air, it absorbs carbon dioxide and water, and falls to a white powder (slaked lime.) 2. Combined with water, it forms calcium hydrate, the incompatibles of which are very similar to those of the fixed alkali hydroxides. See sodii hydroxidum and calcii chloridum.

Uses.—Disinfectant, caustic, antacid, mild astringent.

Prep.—1. **Liquor calcis.** (0,14%.) **Dose, 16 Cc.**

2. **Syrupus calcis.** (6,5%.) **Dose, 2 Cc.**

3. **Linimentum calcis.** (Lime water, 50%.)

CALX CHLORINATA. (Kalks klo-rin-a'-ta.) **Calcis chlorinatae. Chlorinated lime.** Syn.—Chloride of lime. Bleaching powder.

A grayish-white, granular powder, exhaling the odor of hypochlorous acid, having a repulsive, saline taste, and becoming moist and gradually decomposing on expo-

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sure to the air. It should contain not less than 30% of available chlorine.

Sol.—Partially soluble in water or alcohol.

Inc.—Those of chlorine.

Uses.—Deodorant, disinfectant. **Dose, 0,25 Gm.**

Prep.—**Liquor sodae chlorinatae. Dose, 1 Cc.**

CALX SULPHURATA. (Kalks sul-fu-ra'-ta.) **Calcis sulphuratae. Sulphurated lime.** Syn.—Crude calcium sulphide.

A mixture containing at least 60% of calcium sulphide, together with unchanged calcium sulphate and carbon, in varying proportions.

A pale gray powder, exhaling a faint odor of hydrogen sulphide, having a nauseous, alkaline taste, and gradually decomposed by exposure to moist air.

Sol.—Very slightly in water; insoluble in alcohol.

Inc.—Decomposed by **acids,** even carbon dioxide, liberating hydrogen sulphide.

Uses.—Skin irritant, depilatory, alterative. **Dose, 0,065 Gm.**

Adm.—In pills or capsules, with sugar of milk, if necessary to give sufficient bulk.

CAMBOGIA. (Kam-bo'-je-ah.) **Cambogiae. Gamboge.** A gum resin obtained from *Garcinia hanburii.*

Cylindrical pieces of grayish orange-brown color, inodorous; of very acrid taste.

Sol.—With water, it yields a yellow emulsion; 25% soluble in alcohol. Dissolved by solution of alkali hydrates.

Inc.—With tincture **ferric chloride** it gives a black-brown solution.

Uses.—Violent hydragogue cathartic. **Dose, 0,125 Gm.**

Adm.—In pill.

CAMPHORA. (Kam'-for-ah.) **Camphorae. Camphor.** A stearopten obtained from *Cinnamomum camphora,* and purified by sublimation.

White, translucent masses, of a tough consistence and a crystalline structure, readily pulverizable in the pres-

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ence of a little alcohol; having a penetrating, characteristic odor, and a pungently aromatic taste.

Sol.—Very sparingly in water; readily soluble in alcohol, ether, chloroform, carbon disulphide, petroleum benzin, and in fixed and volatile oils.

Inc.—1. **Oxidizing agents** change it to camphoric acid and other substances. 2. Softening or liquefaction occurs when camphor is triturated with about equal weight of **phenol, menthol, thymol, naphthol, salol, resorcinol, pyrogallol, chloral hydrate, ethyl carbamate, resins.**

Uses.—Antiseptic, counterirritant, anodyne, stomachic, carminative, circulatory and nervine stimulant. **Dose, 0,125 Gm.**

Prep.—1. **Aqua camphorae.** (0,8%.) **Dose, 8 Cc.**
2. **Spiritus camphorae.** (10%.) **Dose, 1 Cc.**
3. **Linimentum camphorae.** (20%.)
4. **Ceratum camphorae.** (Camphor liniment, 10%.)

Adm.—In pill (with soap); or capsule; or spirit taken in milk. Hypodermically, solution in oil.

CAMPHORA MONOBROMATA. (Kam′-for-ah mon-o-bro-ma′-ta.) **Camphorae monobromatae. Monobro′mated camphor.**

Colorless, prismatic needles or scales, having a mild camphoraceous odor and taste.

Sol.—Almost insoluble in water; freely soluble in alcohol, ether, chloroform, hot petroleum benzin, and fixed and volatile oils, slightly soluble in glycerin.

Inc.—Liquefied or softened by most substances that produce this change with camphor . (See camphora.)

Uses.—Sedative nervine. **Dose, 0,125 Gm.**

Adm.—In pill, capsule or powder.

CANNABIS INDICA. (Kan′-ab-is in′-dik-ah.) **Cannabis indicae. Indian cann′abis.**. Syn.—Indian hemp. The dried flowering tops of the pistillate plants of *Cannabis sativa*, grown in the East Indies.

Brownish-green compressed masses, consisting of short branches with numerous small flowers, the whole more or less agglutinated with a resinous exudation. Odor agreeably narcotic; taste characteristic.

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Comp.—Cannabin, a brown, amorphous resin; and cannabinon, a soft resin. There are also present volatile oil and alkaloid. There is no agreement as to which of these is the active principle.

Inc.—**Water,** which precipitates the resins from alcoholic solutions.

Uses.—Analgesic, narcotic. **Dose, 0,065 Gm.**

Prep.—1. **Extractum cannabis indicae. Dose, 0,01 Gm.**
2. **Fluidextractum cannabis indicae. Dose, 0,05 Cc.**
3. **Tinctura cannabis indicae.** (10%.) **Dose, 1,00 Cc.**

Adm.—Extract in pill. Tincture or fluidextract in alcoholic vehicle (e. g., compound tincture of cardamom); or mixture with mucilage or syrup of acacia to keep resin in suspension in the water (e. g., cinnamon water).

CANTHARIS. (Kan'-thar-is.) **Canthar'idis. Canthar'ides.** Syn.—Spanish flies. Blister beetles. The beetle *Cantharis vesicatoria*, dried.

Rather long, flattened insect with wing cases of greenish metallic lustre: odor strong and disagreeable; taste slight, afterwards acrid.

Comp.—The active principle, cantharidin (0,4 to 1%) is a crystallizable substance forming colorless plates, soluble in alcohol, ether, chloroform, glacial acetic acid, and oils. It combines with alkalies, forming water-soluble cantharidates. There is also present a volatile oil, giving the odor; and a green oil, the coloring principle.

Inc.—It is precipitated from solutions by **lead acetate, silver nitrate, copper sulphate,** and **mercuric chloride.**

Uses.—Vesicant, diuretic, aphrodisiac. **Dose, 0,03 Gm.**

Prep.—1. **Tinctura cantharidis.** (10%.) **Dose, 0,3 Cc.**
2. **Ceratum cantharidis.** (32%.)
3. **Collodium cantharidatum.** (60%.)

Adm.—Tincture, in aromatic elixir, or adjuvant elixir, to either of which a few drops of spirit of chloroform may be added.

CAPSICUM. (Kap'-sik-um.) **Capsici. Capsicum.** Syn.—Cayenne pepper. The dried fruit of *Capsicum fastigiatum.*

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An oblong-conical, glossy red berry, of distinct odor and intensely pungent taste.

Comp.—Capsaicin, a crystallizable acrid body; capsicin, a volatile alkaloid; fixed oil; resin; fat; etc.

Uses.—Rubefacient, stomachic, carminative. **Dose, 0,065 Gm.**

Prep.—1. **Oleoresina capsici. Dose, 0,03 Gm.**
2. **Fluidextractum capsici. Dose, 0,05 Cc.**
3. **Tinctura capsici.** (10%.) **Dose, 0,50 Cc.**
4. **Emplastrum capsici.** (Oleoresin spread on adhesive plaster.)

Adm.—Oleoresin (with powdered glycyrrhiza) in pill or capsule. Tincture taken in milk.

CARBO ANIMALIS. (Kar'-bo an-im-a'-lis.) **Carbo'nis animalis. Animal charcoal.** Syn.—Bone-black.

Dull black powder, odorless, nearly tasteless.

Sol.—Insoluble.

Inc.—When triturated with **strong oxidizing agents,** there is danger of explosion.

Uses.—Absorbent, deodorant.

Prep.—**Carbo animalis purificatus.** Lime salts removed by HCl.

CARBO LIGNI. (Kar'-bo lig'-ni.) **Carbo'nis ligni. Charcoal.** Syn.—Wood charcoal.

A black, odorless, tasteless, insoluble powder.

Inc.—Same as above.

Uses.—Absorbent, deodorant. **Dose, 1 Gm.**

Adm.—In cachets.

CARBONEI DISULPHIDUM. (Kar-bo'-ne-i di-sul'-fid-um.) **Carbonei disulphidi. Carbon disulphide.**

Clear, colorless liquid, of strong characteristic odor, and a sharp, aromatic taste.

Sol.—526 of water; very soluble in alcohol, ether, chloroform, and fixed and volatile oils.

Uses.—Solvent.

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Small, pale-yellow three celled capsules, enclosing many brown seeds, which have an agreeable odor and a pungent aromatic taste.

Comp.—Volatile oil (4 to 5%), contained in the seeds.

Uses.—Carminative, stomachic, flavoring agent. **Dose, 1 Gm.**

Prep.—1. **Tinctura cardamomi.** (20%.) **Dose, 4 Cc.**

2. **Tinctura cardamomi composita.** (2.5%.) **Dose, 4 Cc.**

CARUM. (Ka'-rum.) **Cari. Car'away.** The dried fruit of *Carum Carvi.*

Small, comma-shaped, dark brown pods, of agreeable aromatic odor and taste.

Comp.—Volatile oil, (5 to 6%.)

Uses.—Carminative, stomachic, flavoring. **Dose, 1 Gm.**

Prepared from caraway by distillation:

Oleum cari. A volatile oil.

For sol. and inc. see olea volatilia. **Dose, 0,2 Cc.**

CARYOPHYLLUS. (Kar-e-o-fil'-us.) **Caryophylli. Cloves.** The dried flower buds of *Eugenia aromatica.*

It consists of a subcylindrical solid calyx-tube, terminated by four teeth, and surmounted by a globular head, formed of four petals, which cover numerous curved stamens, and one style; odor strongly aromatic; taste pungent and aromatic, followed by slight numbness.

Comp.—Volatile oil (18%.)

Uses.—Antiseptic, irritant, local anesthetic, stomachic, carminative. **Dose, 0,25 Gm.**

Prepared from cloves by distillation:

Oleum caryophylli, a volatile oil, consisting chiefly (85%) of eugenol (q. v.) **Dose, 0,2 Cc.**

CASSIA FISTULA. (Cash'-e-ah fis'-tu-lah.) **Cassiæ fistulæ. Cassia fistula.** Syn.—Purging cassia. The dried fruit of *Cassia fistula*

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Comp.—A purgative principle, allied to cathartic acid of senna; sennapicrin, a glucoside; sugar (60%); pectin, etc.

Uses.—Laxative. **Dose, 4 Gm.**

Contained in confectio sennæ, (q. v.)

CATAPLASMA KAOLINI. See cataplasmata, p. 186.

CERA ALBA. (Se'-rah al'-bah.) **Ceræ albæ. White wax.** Yellow wax, bleached.

A yellowish-white solid, having a faint, characteristic odor, and nearly tasteless.

Comp.—See cera flava.

Uses.—To stiffen ointments, cerates, etc.

CERA FLAVA. (Se'-rah fla'-vah.) **Ceræ flavæ. Yellow wax.**

A solid substance prepared from the honey-comb of the bee.

A yellowish to brownish-yellow solid, having an agreeable, honey-like odor, and a faint balsamic taste.

Sol.—Insoluble in water; sparingly soluble in alcohol: completely soluble in ether, chloroform, and in fixed and volatile oils.

Comp.—The principal constituent is myricin; there are also present: cerin, cerylic alcohol, and hydrocarbons.

Uses.—To stiffent ointments, cerates, etc.

CERATA. See p. 184.

CERII OXALAS. (Se'-re-i oks'-al-as.) **Cerii oxala'tis. Cerium oxalate.** A fine, white powder, without odor or taste.

Sol.—Insoluble in water, alcohol or ether; soluble in hot diluted sulphuric or hydrochloric acid.

Inc.—**Alkali hydrates** slowly form cerium hydrate and the oxalate of the alkali.

Uses.—Antemetic. **Dose, 0,065 Gm.**

Adm.—Powder with sugar of milk.

CETACEUM. (Se-ta'-se-um.) **Cetacei. Spermaceti.**

A peculiar, concrete, fatty substance, obtained from the sperm whale.

White ... masses of

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Sol.—Insoluble in water, and nearly so in cold alcohol; soluble in ether, chloroform, carbon disulphide, fixed and volatile oils; only slightly soluble in cold petroleum benzin.

Comp.—Mainly cetylic alcohol in combination with palmitic acid, forming cetin.

Uses.—To stiffen ointments.

Prep.—**Unguentum aquæ rosæ.** (12.5%.)

CHARTA SINAPIS. See chartæ, p. 191.

CHIMAPHILA. (Ki-maf'-il-ah.) **Chimaphilæ. Chimaphila.** Syn.—Pipsissewa. Prince's pine. The dried leaves of *Chimaphila umbellata.*

Oblanceolate, dark-green leaves, sharply serrate above wedge-shaped and nearly entire towards the base nearly inodorous; taste astringent and bitter.

Comp.—Two bitter, crystalline glucosides: arbutin and ericolin. There are also present: chimaphilin and ursone, both tasteless; and tannic acid (4%.)

Uses.—Diuretic, astringent. **Dose, 2 Gm.**

Prep.—**Fluidextractum chimaphilæ. Dose, 2 Cc.**

Adm.—Fluidextract, mixed with syrup.

CHIRATA. (Ke-ra'-tah.) **Chiratæ. Chirata.** Syn.—Chiretta. The dried plant of *Swertia chirayita.*

A tall herb, usually coming on the market in bundles containing root, stem, leaves and flowers; the whole plant being of pale-brown color, slight odor, and intensely bitter taste.

Comp.—The active bitter principle chiratin, combined with ophelic acid. No tannic acid is present.

Uses.—Simple bitter stomachic. **Dose, 1 Gm.**

Prep.—**Fluidextractum chiratæ. Dose, 1 Cc.**

Adm.—May be prescribed with iron preparations.

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Sol.—18,7 of water; 1,3 of alcohol; readily soluble in ether, glycerin, acetone, or acetic ether.

Inc.—**Alkalies**, or **heating** over 60° C. (140° F.) decompose it into chloral.

Uses.—Hypnotic. **Dose, 1 Gm.**

Adm.—In capsules; or in solution in equal parts of aromatic elixir, and alcohol (0,5 Gm. of chloralformamide to 4 Cc. of solvent).

CHLORALUM HYDRATUM. (Klo-ral'-um hi-dra'-tum.) **Chlorali hydrati. Hydrated chloral.** Syn.—Chloral.

Separate, rhomboidal, colorless and transparent crystals, having an aromatic, penetrating, and slightly acrid odor, and a bitterish, caustic taste; slowly volatilized when exposed to the air.

Sol.—Freely in water, alcohol, or ether, chloroform, benzene, petroleum benzin, carbon disulphide, fixed and volatile oil.

Inc.—1. All **alkalies** decompose it, producing chloroform and a formate of the base. 2. Softening or liquefaction occurs when chloral is triturated dry with about an equal weight of any of the following substances: **Camphor, menthol, thymol, phenol, salol, sulphonmethane, sulphonethylmethane, ethyl carbamate, antipyrine, phenacetin, lead acetate, sodium phosphate, quinine sulphate.** 3. With **alcohol**, it forms chloral alcoholate, which is not very soluble in water, and less so in the presence of potassium or sodium bromide.

Uses.—Hypnotic; also antiseptic, rubefacient, local anesthetic. **Dose, 1 Gm.**

Adm.—Solution in aromatic water (e. g., cinnamon water), sweetened with flavoring syrup (e. g., syrup of orange). To be taken freely diluted with water.

CHLOROFORMUM. (Klo-ro-for'-mum.) **Chloroformi. Chloroform.**

A heavy, clear, colorless, mobile and diffusible liquid of a characteristic ethereal odor, and a burning sweet taste. It is not inflammable.

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Sol.—200 of water; mixible with alcohol, ether, benzene, petroleum benzin, and the fixed and volatile oils.

Uses.—General anesthetic, antiseptic, rubefacient, stomachic, antemetic. **Dose, 0,3 Cc.**

Prep.—1. **Aqua chloroformi. Dose, 16 Cc.**
2. **Spiritus chloroformi.** (6%.) **Dose, 2 Cc.**
3. **Emulsum chloroformi.** (4%.) **Dose, 8 Cc.**
4. **Linimentum chloroformi.** (30%.)

Adm.—Chloroform in strongly alcoholic vehicle, e. g., compound tincture of cardamom. Spirit of chloroform in aromatic elixir.

CHLORUM. (Klo′-rum.) **Chlori. Chlorine.** Not official.

A greenish-yellow irrespirable gas.

Uses.—Disinfectant, deodorant.

Prep.—1. **Liquor chlori compositus.** (0,4%.) **Dose, 4 Cc.**
2. **Calx chlorinata.** (q. v.)
3. **Liquor sodae chlorinatae.** (q. v.)

Incompatibles.—Chlorine is a powerful oxidizing agent, and **almost universally incompatible.**

CHONDRUS. (Kon′-drus.) **Chondri. Chondrus.** Syn.—Irish moss. Carragheen. The dried plant of *Chondrus crispus.*

Yellowish-white matted masses, consisting of filiform, much-branched, horny, translucent thalli; of slight sea-weed odor, and mucilaginous, somewhat saline taste.

Comp.—Mucilaginous compounds. (90%.)

Demulcent, nutrient. **Dose, 15 Gm.** in decoction.

CHROMII TRIOXIDUM. (Kro′-me-i tri-oks′-id-um.) **Chromii trioxidi. Chromium trioxide.** Syn.—Chromic acid.

Small, needle-shaped crystals of dark purplish-red color and metallic lustre, odorless. Deliquescent.

Sol.—Very soluble in water, decomposes organic solvents.

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CHRYSAROBINUM. (Kris-ar-o-bi'-num.) **Chrysarobini. Chrysaro'bin.**

A neutral principle extracted from Goa or Araroba powder, a substance found deposited in the wood of *Vouacapoua araroba.*

A pale, orange-yellow, micro-crystalline powder, odorless, tasteless, and irritating to the mucous membrane.

Sol.—4812 of water; 308 of alcohol; 25 of benzene; 18 of chloroform, 114 of ether; 30 of amyl alcohol; 230 of carbon disulphide; also soluble in solution of potassium hydroxide.

Inc.—It is a reducing agent, having a great tendency to be oxidized to chrysophanic acid; hence it is incompatible with **oxidizing agents.**

Uses.—Antiseptic, and skin irritant. **Dose, 0,03 Gm.**

Prep.—**Unguentum chrysarobini.** (6%.)

CIMICIFUGA. (Sim-is-if'-u-gah.) **Cimicifugae. Cimicifuga.**

Syn.—Black snake root. Black cohosh. The dried rhizome and roots of *Cimicifuga racemosa.*

Irregular knotty brownish-black rhizome with many rootlets; odor slight but heavy; taste, bitter and acrid.

Comp.—An acrid, crystalline principle, soluble in alcohol and chloroform; two resins; tannic and gallic acids.

Inc.—Those of tannic acid.

Uses.—Astringent bitter. Antispasmodic. **Dose, 1 Gm.**

Prep.—1. **Extractum cimicifugae. Dose, 0,25 Gm.**

2. **Fluidextractum cimicifugae. Dose, 1 Cc.**

3. **Tinctura cimicifugae.** (20%.) **Dose, 4 Cc.**

Adm.—Tincture in aromatic elixir.

CINCHONA. (Sin-ko'-nah.) **Cinchonae. Cinchona.** Syn.—Peruvian bark. The dried bark of *Cinchona ledgeriana, Cinchona calisaya, Cinchona officinalis,* and hybrids of these with other species of Cinchona.

Quills or curved pieces of light cinamon-brown color, with or without gray cork, odor slight, aromatic; taste bitter and somewhat astringent.

Comp.—5 alkaloids; quinine, quinidine, cinchonine, cinchonidine and quinamine. Assay should yield not less than 5% of alkaloids. Then there is the glucoside,

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kinovin, which is easily decomposed into glucose and kinovic acid; the latter, as well as kinic acid, and cinchotannic acid are also present. The coloring matter of the bark is cinchona red, which is an oxidation product of cinchotannic acid. The bark owes its smell to the presence of a minute quantity of a volatile oil.

Inc.—See quinina and acidum tannicum.

Uses.—Bitter tonic, antimalarial. **Dose, 1 Gm.**

Prep.—1. **Fluidextractum cinchonae. Dose, 1 Cc.**

2. **Tinctura cinchonae.** (20%.) **Dose, 4 Cc.**

CINCHONA RUBRA. (Sin-ko'-nah ru'-brah.) **Cinchonae rubrae. Red cinchona.** The dried bark of *Cinchona succirubra.* Differs from cinchona in having a deep reddish-brown color.

Comp., inc., and uses.—See cinchona. **Dose, 1 Gm.**

Prep.—**Tinctura cinchonae composita.** (10%.) **Dose, 4 Cc.**

Adm.—The compound tincture is the most elegant of the cinchona preparations; all of which are but rarely employed at present; the alkaloids, especially quinine, having almost completely superseded them. (See quinine.)

CINCHONIDINAE SULPHAS. (Sin-kon-id-i'-ne sul'-fas.) **Cinchonidinae sulpha'tis. Cinchon'idine sulphate.** The sulphate of an alkaloid obtained from cinchona bark.

White, silky, glistening needles or prisms, without odor, and having a very bitter taste.

Sol.—63 of water; 72 of alcohol; 900 of chloroform; almost insoluble in ether.

Uses.—Like quinine. **Dose, 0,25 Gm.**

CINCHONINAE SULPHAS. (Sin-ko-ni'-ne sul'-fas.) **Cinchoninae sulpha'tis. Cin'chonine sulphate.** The sulphate of an alkaloid obtained from cinchona bark.

White, hard, lustrous, prismatic crystals; odorless; having a very bitter taste.

Sol.—58 of water; 10 of alcohol; 69 of chloroform; 2300 of ether.

Uses.—Like quinine. **Dose, 0,25 Gm.**

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CINNALDEHYDUM. (Sin-al-de-hi'-dum.) **Cinnaldehydi. Cinnamic aldehyde.** An aldehyde obtained from oil of cinnamon or prepared synthetically.

A colorless liquid, having a cinnamon-like odor and a burning, aromatic taste.

Sol.—Sparingly in water; soluble in all proportions in alcohol, ether, and fixed and volatile oils.

Uses.—Like oil of cinnamon. **Dose, 0,05 Cc.**

CINNAMOMUM SAIGONICUM. (Sin-am-o'-mum sa-e-gon'-ik-um.) **Cinnamomi saigonici. Saigon cin'namon.** The bark of an undetermined species of *Cinnamomum.*

Large troughs or quills, outer surface gray or light grayish-brown with whitish patches; the inner surface cinnamon-brown; odor fragrant; taste sweet, warmly aromatic, somewhat astringent.

Comp.—Volatile oil; tannic acid, sugar, etc.

Inc.—Those of tannic acid.

Uses.—Flavoring agent, stomachic, carminative, somewhat astringent. **Dose, 0,25 Gm.**

Prep.—1. **Tinctura cinnamomi.** (20%.) **Dose, 2 Cc.**
2. **Pulvis aromaticus.** (35%.) **Dose, 1 Gm.**
3. **Fluidextractum aromaticum. Dose, 1 Cc.**

CINNAMOMUM ZEYLANICUM. (Sin-am-o'-mum ze-lan'-ik-um.) **Cinnamomi zeylanici. Ceylon cinnamon.** The inner bark of the shoots of *Cinnamomum zeylanicum.*

Thin, papery, compound quills, pale yellowish-brown; odor fragrant, taste sweet and warmly aromatic.

Comp., inc., and dose.—Same as saigon cinnamon. (See above.)

COCA. (Ko'-kah.) **Cocae. Coca.** Syn.—Erythroxylon. The dried leaves of *Erythroxylon coca.*

Greenish-brown, smooth, and slightly glossy, medium-sized, thick leaves, characterized by a curved line on each side of the midrib. The odor is characteristic; taste bitterish, faintly aromatic, followed by a numbness of

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of which is Cocaine (about 0,2%); the others are cocamine, and cinnamylcocaine. There are also present coca-tannic acid and coca-wax.

Inc.—See cocaina.

Uses.—Stimulant nervine. **Dose, 2 Gm.**

Prep.—1. **Fluidextractum cocae. Dose, 2 Cc.**

2. **Vinum cocae.** (6.5% of fluidextract.) **Dose, 16 Cc.**

Adm.—Fluidextract with flavoring syrup (e. g., **syrup of** orange flowers); or the wine.

COCAINA. (Ko-kah-i'-nah.) **Cocainae. Co'caine.** An alkaloid obtained from coca.

Large, colorless crystals, having a slightly bitter taste, and producing on the tongue a temporary numbness.

Sol.—600 of water; 5 of alcohol; 3.8 of ether; 14 of oil of turpentine; 12 of olive oil; very soluble in chloroform; also soluble in benzene, carbon disulphide, and ethyl acetate; insoluble in glycerin.

Inc.—Strong **acids,** strong solutions of **alkali hydrates** or **hot water** decompose it, forming ecgonine, benzoic acid, and methyl alcohol. 2. The **general alkaloidal precipitants.**

Uses.—Local anesthetic. **Dose, 0,03 Gm.**

Prep.—**Oleatum cocainae.** (5%.)

Adm.—Generally in form of the hydrochloride, which is soluble in water (see below).

COCAINAE HYDROCHLORIDUM. (Ko-kah-i'-ne hi-dro-klo'-rid-um.) **Cocainae hydrochloridi. Cocaine hydrochloride.** The hydrochloride of an alkaloid obtained from coca.

Colorless, transparent, monoclinic prisms, flaky leaflets, or a white crystalline powder, without odor; of a saline, slightly bitter taste, and producing upon the tongue a tingling sensation followed by numbness of several minutes' duration.

Sol.—0.4 of water; 2.6 of alcohol; 18.5 of chloroform; **insoluble** in ether, benzene, petroleum benzin, oils.

Inc.—See cocaina.

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Uses.—Local anesthetic; mydriatic; respiratory and circulatory stimulant. **Dose, 0,03 Gm.**

Adm.—Locally 2 to 10% aqueous solution. Internally tablet or pill (with sugar of milk).

COCCUS. (Kok'-us.) **Cocci. Cochineal'.** Syn.—Cochineal bug. The dried female insect, *Pseudococcus cacti.*

Oblong, angular granules of purplish-gray or purplish-black color, faint odor; slightly bitter taste.

Comp.—Carmine (10%) a glucoside; wax; and fat.

Inc.—Acids precipitate carmine from its aqueous solution.

Uses.—Coloring agent; employed generally in form of carmine.

CODEINA. (Ko-de-i'-nah.) **Codeinae. Co'deine.** Syn.—Methyl morphine. An alkaloid obtained from opium, or prepared from morphine by methylation.

White, or nearly translucent, rather large crystals, or a crystalline powder; odorless, and having a faintly bitter taste.

Sol.—88 of water; 1.6 of alcohol; 12.5 of ether; 0.66 of chloroform.

Inc.—1. Codeine salts in aqueous solution are precipitated by **most alkaloidal precipitants** (see alkaloids), excepting alkaline carbonates and bicarbonates. 2. Being quite strongly alkaline and fairly soluble, it has some of the incompatibilities of alkalies; thus it liberates ammonia from **ammonium salts,** precipitates some of the **heavy metals,** and may even precipitate **morphine** from solutions of its salts.

Uses.—Analgesic, antibechic. **Dose, 0,03 Gm.**

Adm.—In pill or powder. Its salts are preferred for aqueous solution.

CODEINAE PHOSPHAS. (Ko-de-i'-ne fos'-fas.) **Codeinae phospha'tis. Co'deine phosphate.**

Fine, white, needle-shaped crystals, or a crystalline powder, without odor, and having a bitter taste.

Sol.—2.25 of water; 261 of alcohol; 1340 of ether; 6620 of chloroform.

Inc.—See codeina.

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Uses.—Analgesic, antibechic. **Dose, 0,03 Gm.**
Adm.—In flavoring syrup, e. g., syrup of tolu.

CODEINAE SULPHAS. (Ko-de-i'-ne sul'-fas.) **Codeinae sulpha'tis. Co'deine sulphate.**
Long glistening, white, needle-shaped crystals, rhombic prisms, or a crystalline powder, effloresceing in the air, odorless, and having a bitter taste.
Sol.—30 of water; 1035 of alcohol; insoluble in chloroform or ether.
Inc.—See codeina.
Uses.—Analgesic, antibechic. **Dose, 0,03 Gm.**
Adm.—See codeinae phosphas.

COLCHICI CORMUS. (Kol'-chis-i kor'-mus.) **Colchici cormi. Colchicum corm.** Syn.—Meadow saffron. The dried corm of *Colchicum autumnale.*
Usually found in kidney-shaped grayish-white slices; odor slight; taste sweetish, bitter, and somewhat acrid.
Comp.—The chief constituent is the alkaloid colchicine, of which the drug, when assayed, should not yield less than 0.35%.
Sol. and inc. of colchicine, see colchicina.
Uses.—Alterative in gout. **Dose, 0,25 Gm.**
Prep.—**Extractum colchici cormi. Dose, 0,065 Gm.**

COLCHICI SEMEN. (Kol'-chis-i se'-men.) **Colchici seminis. Colchicum seed.** The seed of *Colchicum autumnale.*
Small, nearly globular, reddish-brown seeds; nearly inodorous; taste bitter and somewhat acrid.
Comp.—Colchicine, at least 0.55% on assay.
Sol. and inc. of colchicine, see colchicina.
Uses.—Alterative in gout. **Dose, 0,20 Gm.**
Prep.—1. **Fluidextractum colchici seminis. Dose, 0,2 Cc.**
2. **Tinctura colchici seminis.** (10%.) **Dose, 2,0 Cc.**
3. **Vinum colchici seminis.** (Fluidextract, 10%.) **Dose. 2.0 Cc.**

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COLCHICINA. (Kol-chis-i'-nah.) **Colchicinae. Col'chicine.** An alkaloid obtained from colchicum.

Pale yellow leaflets, or a pale yellow powder, having an odor suggesting damp hay, and a very bitter taste.

Sol.—22 of water; 155 of ether; 87 of benzene; very soluble in alcohol and chloroform; insoluble in petroleum benzin.

Inc.—1. **Strong acids** or strong solutions of **alkalies** decompose colchicine forming colchiceine. 2. The **alkaloidal precipitants** (see alkaloids.)

Uses.—Alterative in gout. **Dose, 0,0005 Gm.**

Adm.—In capsule or pill (with sugar of milk).

COLLODIUM. See collodia, p. 177.

COLOCYNTHIS. (Kol-o-sin'-this.) **Colocyn'thidis. Col'ocynth.** Syn.—Bitter apple. The peeled dried fruit of *Citrullus Colocynthis.*

Rather large, globular, very light, spongy, white or yellowish-white fruit; readily breaking into three wedge-shaped pieces, showing seeds; inodorous; taste intensely bitter.

Comp.—Colocynthin, a bitter glucoside, about 2%; and resinous matter having the names of Citrullin, Colocynthein, and Colocynthitin.

Sol.—The active principle, colocynthin is more soluble in alcohol than in water; insoluble in ether.

Inc.—Colocynthin is precipitated from aqueous solution by **tannin.**

Uses.—Drastic cathartic. **Dose, 0,065 Gm.**

Prep.—1. **Extractum colocynthidis. Dose, 0,03 Gm.**

2. **Extractum colocynthidis compositum.** (Extract 16%.) **Dose, 0,50 Gm.**

3. **Pilulae catharticae compositae.** (Compound extract 0,08 Gm. in each.) **Dose, 2 pills.**

4. **Pilulae catharticae vegetabiles.** (Compound extract 0,06 Gm. in each.) **Dose, 2 pills.**

CONFECTIONES. See p. 149.

CONIUM. (Ko-ni'-um.) **Conii. Conium.** Syn.—Spotted hemlock. The full grown, but unripe fruit of *Conium maculatum.*

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Small ovoid, grayish-green fruits; each fruit with 5 nodulated ridges and 2 deep lateral grooves; no oil-tubes; odor slight; taste characteristic, disagreeable, afterwards somewhat acrid.

Comp.—The active principle is coniine, a colorless, oily, volatile alkaloid, of a disagreeable, mouse-like odor and acrid taste. The drug should yield, when assayed, not less than 0.5% of coniine.

Sol.—Coniine is soluble in 100 of water; freely soluble in alcohol, ether, and the fixed and volatile oils.

Inc.—1. Coniine is precipitated by the **general alkaloidal precipitants.** (See alkaloids); excepting the alkalies, which liberate it, however, from its combinations, e. g., in the fruit, giving rise to its characteristic odor. 2. It coagulates **albumin,** and precipitates the salts of **aluminum, copper, zinc, manganese, iron,** and **silver.** 3. With most **oxidizing agents** it forms butyric acid.

Uses.—Motor depressant. **Dose, 0,20 Gm.**

Prep.—**Fluidextractum conii. Dose, 0,2 Cc.**

CONVALLARIA. (Kon-val-a′-re-ah.) **Convallariae. Convallaria.** Syn.—Lily of the valley.

The dried rhizome and roots of *Convallaria majalis.* Thin, branched, straw-colored rhizome with hair-like rootlets; odor peculiar, pleasant; taste sweetish, bitter, and slightly acrid.

Comp.—The active principle is convallamarin, a glucoside, a white, bitter-sweet powder, soluble in water and alcohol. Convallarin, another glucoside, sparingly soluble in water, but soluble in alcohol, is said to be only purgative.

Uses.—Heart tonic. **Dose, 0,50 Gm.**

Prep.—**Fluidextractum convallariae. Dose, 0,5 Cc.**

COPAIBA. (Ko-pa′-e-bah.) **Copaibae. Copaiba.** Syn.—Balsam of copaiba. Copaiva.

An oleoresin derived from one or more South American species of Copaiba.

A transparent viscid, yellowish liquid, having a peculiar, aromatic odor, and a persistent, bitter and acrid taste.

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Comp.—Volatile oil, (about 40%); resin; bitter principle; copaivic acid.

Sol.—Insoluble in water; soluble in absolute alcohol, ether, chloroform, carbon disulphide, petroleum benzin, and fixed and volatile oils.

Inc.—With the **hydrates of the alkalies** or the **alkaline earth metals,** copaiba forms soaps which in case of magnesium hydrate and of calcium hydrate is a solid mass.

Uses.—Stimulant to mucous membranes, diuretic, blennorrhetic, expectorant. **Dose, 1 Cc.**

Prepared from copaiba by distillation: **Oleum copaibae,** a volatile oil. **Dose, 0,5 Cc.**

Adm.—Copaiba or the oil are best prescribed in capsules; they may also be given in emulsion with tincture of orange and cinnamon water or peppermint water for correction of taste.

CORIANDRUM. (Ko-re-an′-drum.) **Coriandri. Corian′der.** The dried ripe fruit of *Coriandrum sativum.*

Small, globular, brownish-yellow fruit of agreeably aromatic taste and odor.

Comp.—Volatile oil.

Uses.—Flavoring agent, carminative. **Dose, 0,50 Gm.**

Prepared from coriander by distillation: **Oleum coriandri.** A volatile oil. **Dose, 0,2 Cc.**

CREOSOTUM. (Kre-o-so′-tum.) **Creosoti. Cre′osote.**

A mixture of phenols and phenol derivatives, obtained during the distillation of wood tar, preferably of that derived from the beech.

An almost colorless, yellowish (not pinkish), highly refractive, oily liquid, having a penetrating smoky odor, and a burning caustic taste.

Sol.—140 of water; freely in alcohol, ether, chloroform, acetic acid, and oils.

Inc.—1. A reducing agent; hence incompatible with **oxidizing agents;** with some of which explosion is liable to result.

2. Color reactions. With **ferric salts,** violet-blue.

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3. Precipitates **albumin**; but not gelatin or collodion.

Uses.—Antiseptic, local analgesic, antemetic, stimulant expectorant. **Dose, 0,2 Cc.**

Prep.—**Aqua creosoti. Dose, 8 Cc.**

Adm.—In capsules; or in solution in cod liver oil; or mixed with equal parts of alcohol, compound tincture of gentian, and fluidextract of glycyrrhiza; or dropped into milk.

CRESOL. (Kre'-sol.) **Creso'lis. Cresol.**

A mixture of three isomeric cresols obtained from coal tar.

A colorless or straw-colored liquid, having a phenol-like odor, and turning yellowish-brown on prolonged exposure to light.

Sol.—60 of water; mixable with alcohol, ether, glycerin, benzene, petroleum benzin, and alkali hydroxide solutions.

Uses.—Antiseptic, disinfectant. **Dose, 0,05 Cc.**

Prep.—**Liquor cresolis compositus.** (50%.)

Adm.—The compound solution, 1 to 2% in water, for skin; ½ to 1% for mucous membranes.

CRETA PRAEPARATA. (Kre'-tah pre-par-a'-tah.) **Cretae praeparatae. Prepared Chalk.** Syn.—Drop chalk.

A white to grayish-white, very fine amorphous powder, often moulded into conical drops, odorless and tasteless.

Sol.—Almost insoluble in water; insoluble in alcohol.

Inc.—**Acids.**

Uses.—Absorbent, antacid, mildly astringent. **Dose, 1 Gm.**

Prep.—1. **Pulvis cretae compositus.** (30%.) **Dose, 2 Gm.**

2. **Mistura cretae.** (Comp. chalk powder, 20%.) **Dose, 16 Cc.**

Adm.—Powder or mixture.

CUBEBA. (Ku-be'-bah.) **Cubebae. Cu'beb.** The dried unripe, but fully grown fruit of *Piper Cubeba.* It is a round drupe, about the size of a small pea, of blackish-brown color, and furnished with a short stalk; odor strong spicy; taste aromatic and pungent.

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Comp.—Volatile oil, 5 to 15%; cubebin, a white, crystalline, odorless substance; and cubebic acid, a soft resin, which is claimed to be the peculiar active principle.

Uses.—Stimulant to mucous membranes, blennorhetic, diuretic, expectorant. **Dose, 1 Gm.**

Prep.—1. **Fluidextractum cubebae. Dose, 1 Cc.**
2. **Oleoresina cubebae. Dose, 0,50 Gm.**
3. **Trochisci cubebae.** (0,02 Gm. of oleoresin each.)

Prepared from cubeb by distillation: **Oleum cubebae,** a volatile oil. **Dose, 0,50 Cc.**

Adm.—The oleoresin is the most active preparation; it is best given in capsules; may also be administered in emulsion.

CUPRI SULPHAS. (Ku'-pri sul'-fas.) **Cupri sulpha'tis. Copper sulphate.** Syn.—Blue vitriol. Bluestone.

Large, transparent, deep blue, triclinic crystals; odorless, of a nauseous metallic taste.

Sol.—2,2 of water; 400 of alcohol; 3,5 of glycerin.

Inc.—(a) 1. Precipitated by **fixed alkali hydrates;** precipitation more or less prevented by many organic substances. Ammonia water and ammonium carbonate produce a precipitate, which is redissolved by excess.
2. Precipitated by **carbonates of the fixed alkalies, phosphates, arsenites, albumin, tannic acid.**
3. **Reducing agents** reduce cupric compounds in alkaline mixture to cuprous. **Soluble iodides** precipitate cuprous iodide, iodine being liberated.
(b) Those of soluble sulphates.

Uses.—Astringent, **dose, 0,01 Gm.**; emetic, **dose, 0,25 Gm.**

Adm.—1/5 to 3% aqueous solution as lotion. As emetic in aqueous solution. As intestinal astringent, in pill.

CUSSO. (Kūs'-so.) **Cusso. Kousso.** Syn.—Brayera. The dried panicles of the pistillate flowers of *Hagenia abyssinica.*

Large, reddish-brown panicles in rolls or compressed bundles; odor slight; taste bitter.

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Comp.—Kosin (3%) a neutral active principle, insoluble in water, soluble in alcohol, ether, chloroform, benzene. Also present tannin acid (24%); and two resins.
Uses.—Anthelmintic against tape worm. **Dose, 16 Gm.**
Adm.—Infusion with lemon juice.

CYPRIPEDIUM. (Sip-rip-e′-de-um.) **Cypripedii. Cypripedium.** Syn.—Lady's slipper.
The dried rhizome and roots of *Cypripedium hirsutum,* or of *Cypripedium parviflorum.*
Curved, orange-brown rhizome, with many stem-scars above, and wavy rootlets below; odor heavy, valerian-like; taste sweetish, bitter, and somewhat pungent.
Comp.—Volatile oil; resins; tannin.
Uses.—Gentle antispasmodic. **Dose, 1 Gm.**
Prep.—**Fluidextractum cypripedii. Dose, 1 Cc.**

DECOCTA. See p. 112.

DIGITALIS. (Dij-it-a′-lis.) **Digitalis. Digitalis.** Syn.—Foxglove.
The dried leaves of *Digitalis purpurea.*
Rather large, ovate, pale-green leaves; under surface densely hairy and conspicuously reticulated; odor slight, characteristic; taste strongly bitter.
Comp.—5 glucosides, the most active of which is digitoxin; digitalin, and digitalein, likewise highly active as cardiac stimulants; while digitonin, probably identical with saponin, is a cardiac depressant; and digitin is devoid of action.
Inc.—1. All of the digitalis principles are quite easily decomposed by **strong acids** or **alkalies.**
2. **Lead acetates, tannic acid** and other vegetable astringents precipitate glucosides.
3. **Ferric salts,** owing to presence of a small quantity of tannin.
Uses.—Heart stimulant, diuretic. **Dose, 0,065 Gm.**
Prep.—1. **Extractum digitalis. Dose, 0,01 Gm.**

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Adm.—Tincture is the best preparation; may be prescribed with syrup of orange. The powdered drug or the extract may be given in pill.

ELASTICA. (E-las′-tik-ah.) **Elasticae. Rubber.** Syn.—India-rubber. Caoutchouc. The prepared milk-juice of several species of Hevea.

Brownish masses of creosote-like odor; nearly tasteless.

Sol.—Insoluble in water, dilute acids, or dilute solutions of alkalies; soluble in chloroform, carbon disulphide, oil of turpentine, petroleum benzin, and benzene.

Uses.—For making plasters, etc.

ELATERINUM. (El-at-er-i′-num.) **Elaterini. Elat′erin.** A neutral principle obtained from elaterium, which is a grayish-green substance deposited by the juice of the fruit of *Ecballium elaterium,* the squirting cucumber.

Minute, white scales or crystals, odorless, and having a slightly acrid, bitter taste.

Sol.—Insoluble in water; soluble in 262 of alcohol; 318 of ether; 22 of chloroform. Forms water-soluble compounds with the alkali hydrates; from the solution of which acids precipitate the elaterin.

Inc.—Precipitated from alcoholic solution by **lead acetate** and **silver nitrate.**

Uses.—Hydragogue cathartic. **Dose, 0,005 Gm.**

Prep.—**Trituratio elaterini.** (10%.) **Dose, 0,03 Gm.**

Adm.—The trituration (with sugar of milk) in powders or pills.

ELIXIRES. See p. 93.

EMPLASTRA. See p. 188.

EMULSA. See p. 99.

ERGOTA. (Ur-go′-tah.) **Ergotae. Er′got.** Syn.—Ergot of rye.

The sclerotium of the fungus, *Claviceps purpurea,* replacing the grain of rye.

Fusiform, purplish-black grains; odor peculiar, heavy; taste oily and disagreeable.

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Comp.—It is an exceedingly complex substance, the composition of which has not yet been made out with certainty.

Inc.—The **general alkaloidal precipitants.** (See alkaloida.)

Uses.—Oxytocic, uterine hemostatic. **Dose, 2 Gm.**

Prep.—1. **Extractum ergotae.** (Syn.—Ergotin.) **Dose, 0,50 Gm.**

2. **Fluidextractum ergotae. Dose, 2 Cc.**

3. **Vinum ergotae.** (Fluidextract 20%.) **Dose, 8 Cc.**

Adm.—Fluidextract is the best preparation; may be prescribed with tincture of sweet orange peel and aromatic elixir.

ERIODICTYON. (Er-e-o-dik′-te-on.) **Eriodictyi. Eriodictyon.** Syn.—Yerba santa.

The dried leaves of *Eriodictyon californicum.*

Lanceolate, dentate, yellowish-green leaves; odor somewhat aromatic; taste balsamic and sweetish.

Comp.—Acrid resin; volatile oil; tannic acid (8%); etc.

Uses.—Vehicle for bitter drugs; stimulant expectorant. **Dose, 1 Gm.**

Prep.—**Fluidextractum eriodictyi. Dose, 1 Cc.**

Adm.—The aromatic syrup (syrupus eriodictyi aromaticus, N. F.) is its most elegant preparation.

EUCALYPTOL. (U-kal-ip′-tol.) **Eucalypto′lis. Eucalyptol.** Syn.—Cineol.

An organic oxide, obtained from oil of eucalyptus, and from other sources.

A colorless liquid, having a characteristic, aromatic, and somewhat camphoraceous odor, and a pungent, spicy, and cooling taste.

Sol.—Mixable with alcohol.

Uses.—Same of eucalyptus. **Dose, 0,3 Cc.**

Adm.—On sugar, in capsules, or in emulsion.

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gin; odor aromatic, somewhat, camphoraceous; taste aromatic, bitter and cooling.

Comp.—A volatile oil (6%); a crystallizable resin; a crystallizable fatty acid; cerylic alcohol; tannic acid, etc.

Inc.—**Alkalies, mineral acids, metallic salts.**

Uses.—Antiseptic, stomachic, carminative, expectorant, diuretic. **Dose, 2 Gm.**

Prep.—**Fluidextractum eucalypti. Dose, 2 Cc.**

Prepared by distillation from the fresh leaves: **Oleum eucalypti.** A volatile oil, yielding, when assayed, not less than 50% of cineol (eucalyptol). **Dose, 0,50 Cc.**

Adm.—The oil of eucalyptus is the best preparation; it may be administered on sugar, in capsules or in emulsion.

EUGENOL. (U′-je-nol.) **Eugeno′lis. Eugenol.**

An unsaturated, aromatic phenol obtained from oil of cloves and other sources.

A colorless, or pale yellow, thin liquid, having a strongly aromatic odor of cloves, and a pungent and spicy taste.

Sol.—Mixable with alcohol, ether, chloroform.

Uses.—Same as oil of cloves. (See caryophyllus.) **Dose, 0,2 Cc.**

EUONYMUS. (U-on′-im-us.) **Euonymi. Euonymus.** Syn.—Wahoo.

The dried bark of the root of *Euonymus atropurpureus.*

Quilled or curved pieces, with ash-gray outer, and whitish or slightly tawny inner surface; odor distinct; taste sweetish, somewhat bitter and acrid.

Comp.—Euonymin, an amorphous, bitter resin; atropurpurin, a crystalline glucoside.

Uses.—Purgative. **Dose, 0,50 Gm.**

Prep.—1. **Extractum euonymi. Dose, 0,125 Gm.**
2. **Fluidextractum euonymi. Dose, 0,50 Cc.**

Adm.—Extract in pills.

EUPATORIUM. (U-pat-o′-re-um.) **Eupatorii. Eupatorium.** Syn.—Thoroughworth. Boneset.

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The dried leaves and flowering tops of *Eupatorium perfoliatum.*

Stem hairy; leaves lanceolate, united at their base around the stem; compound flower head with from ten to fifteen yellowish-white tubular florets; odor faintly aromatic; taste strongly bitter.

Comp.—Eupatorin, a bitter glucoside; volatile oil; resin.

Uses.—Diaphoretic in infusion; mildly laxative. **Dose, 2 Gm.**

Prep.—**Fluidextractum eupatorii. Dose, 2 Cc.**

EXTRACTA. See p. 133.

FEL BOVIS. (Fel bo'-vis.) **Fellis bovis. Oxgall.** The fresh bile.

A brownish-green or dark-green, somewhat viscid liquid, having a peculiar, unpleasant odor, and a disagreeable bitter taste.

Prep.—**Fel bovis purificatum.** Soft solid. **Dose, 0,50 Gm.**

Uses.—Cholagogue purgative.

Adm.—The purified oxgall in pill.

FERRI CARBONAS SACCHARATUS. (Fer'-i kar'-bon-as sak-ar-a'-tus.) **Ferri carbona'tis saccharati. Sac'charated Ferrous carbonate.**

A greenish-brown powder, of a sweetish, afterwards slightly ferruginous taste. It should contain not less than 15% of ferrous carbonate.

Sol.—Only partially soluble in water.

Inc.—Very unstable compound, being easily oxidized. Dissolved by acids with copious evolution of carbon dioxide.

Uses.—Hematinic. **Dose, 0,25 Gm.**

Other preparations containing ferrous carbonate:

1. **Mistura Ferri Composita. Dose, 16 Cc.**
2. **Pilulae Ferri Carbonatis.** (0,06 Gm. each.) **Dose, 2 pills.**
3. **Massa Ferri Carbonatis.** (42% .) **Dose, 0,25 Gm.**

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FERRI CHLORIDUM. (Fer'-i klo'-rid-um.) **Ferri Chloridi. Ferric chloride.**

Orange-yellow, crystalline pieces, very deliquescent, having a faint odor of hydrochloric acid, and a strongly styptic taste.

Sol.—Freely in water or alcohol.

Inc.—1. Precipitated by **alkali hydrates** and **carbonates, phosphates, hypophosphites, arsenites, sulphides, cyanides, ferrocyanides, borax, benzoates.** The presence of acid in excess, of alkali citrates, or tartrates prevents precipitation in some cases.

2. Ferric salts are oxidizing agents; they liberate iodine from solutions of soluble **iodides** or **hydriodic acid; sulphites** are changed to sulphates; **hypophosphites** to phosphates; etc.

3. Especially with organic compounds numerous color reactions are produced. With **tannic acid,** black (excess of phosphoric acid destroys the color by forming colorless ferric phosphate); with **gallic acid,** black; with **acetates,** dull red; with **ferrocyanides,** brown; with **salicylates,** violet; **phenol,** green to violet; **creosote** or guaiacol, violet to green-brown; with **antipyrine acetphenitidin,** or alcoholic solution of **acetanilide,** red; with **volatile oils,** or **balsams,** colors varying from blue and green to brown and black.

4. Mucilage of **acacia** is gelatinized; **albumen** coagulated.

Uses.—Hematinic. **Dose, 0,065 Gm.**

Prep.—1. **Liquor ferri chloridi.** (29%.) **Dose, 0,1 Cc.**

2. **Tinctura ferri chloridi.** (13%.) **Dose, 0,5 Cc.**

3. **Liquor ferri et ammonii acetatis.** (Tincture, 4%.) **Dose, 16,0 Cc.**

Adm.—Tincture ferric chloride may be prescribed with glycerin, or with syrup of citric acid, to be freely diluted with water, and taken through a glass tube. The solution of iron and ammonium acetate is an elegant iron preparation ready for administration.

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FERRI CITRAS. (Fer'-i si'-tras.) **Ferri citra'tis. Ferric citrate.**

Thin, transparent, garnet-red scales, odorless, having a slightly ferruginous taste and an acid reaction.

Sol.—Slowly but completely in water; insoluble in alcohol.

Uses.—Hematinic. **Dose, 0,25 Gm.**

Adm.—In pill.

FERRI ET AMMONII CITRAS. (Fer'-i et am-o'-ne-i si'-tras.) **Ferri et ammonii citra'tis. Iron and ammonium citrate.**

Thin, transparent, garnet-red scales, having a saline, mildly ferruginous taste; deliquescent.

Sol.—Very soluble in water; insoluble in alcohol.

Uses.—Hematinic. **Dose, 0,25 Gm.**

Prep.—**Vinum ferri.** (4%.) **Dose, 8 Cc.**

Adm.—One of the best non-astringent iron salts for solution, which may be flavored with syrup of orange.

FERRI ET AMMONII SULPHAS. (Fer'-i et am-o'-ne-i sul'-fas.) **Ferri et amonii sulpha'tis. Ferric ammonium sulphate.** Syn.—Ammonio-ferric sulphate. Ammonio-ferric alum.

Pale violet, octahedral crystals, efflorescent, odorless, having an acid, styptic taste, and a slightly acid reaction.

Sol.—In 2,7 parts of water; insoluble in alcohol.

Inc.—See ferri chloridum and acidum sulphuricum.

Uses.—Astringent. **Dose, 0,50 Gm.**

Adm.—Aqueous solution, sweetened with glycerin, or with syrup of orange.

FERRI ET AMMONII TARTRAS. (Fer'-i et am-o'-ne-i tar'-tras.) **Ferri et ammonii tartra'tis. Iron and ammonium tartrate.**

Thin, transparent scales, from garnet-red to reddish-

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FERRI ET POTASSII TARTRAS. (Fer′-i et po-tas′-e-i tar′-tras.) **Ferri et potassii tartra′tis. Iron and potassium tartrate.**

Thin, transparent, garnet-red to reddish-brown scales, having a sweetish ferruginous taste.

Sol.—Very soluble in water; insoluble in alcohol.

Uses.—Hematinic. **Dose, 0,25 Gm.**

Adm.—See ferri et ammonii citras.

FERRI ET QUININAE CITRAS. (Fer′-i et kwin-i′-ne si′-tras.) **Ferri et quininae citra′tis. Iron and qui′nine citrate.**

Thin, transparent, reddish-brown scales of a bitter, mildly ferruginous taste.

Sol.—Slowly but completely in water; partially soluble in alcohol.

Uses.—Hematinic, tonic. **Dose, 0,25 Gm.**

Adm.—In pill.

FERRI ET QUININAE CITRAS SOLUBILIS. (Fer′-i et kwin-i′-ne si′-tras sol-u′-bil-is.) **Ferri et quininae citra′tis solubilis. Soluble iron and quinine citrate.**

Thin, transparent scales, of a greenish, golden-yellow color, having a bitter, mildly ferruginous taste; deliquescent.

Sol.—Rapidly and completely soluble in cold water, partially soluble in alcohol.

Uses.—Hematinic, tonic. **Dose, 0,25 Gm.**

Prep.—**Vinum ferri amarum.** (5%.) **Dose, 8 Cc.**

Adm.—The wine; or aqueous solution flavored with syrup of orange.

FERRI ET STRYCHNINAE CITRAS. (Fer′-i et strik-ni′-ne si′-tras.) **Ferri et strychninae citra′tis. Iron and strychnine citrate.**

Thin, transparent, garnet-red to yellowish-brown scales, having a bitter, slightly ferruginous taste. Deliquescent.

Sol.—Completely in water; partially in alcohol.

Uses.—Hematinic, tonic. **Dose, 0,125 Gm.**

FERRI HYDROXIDUM. (Fer′-i hi-droks′-id-um.) **Ferri hydroxidi. Ferric hydroxide.**

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A reddish-brown magma, wholly soluble in hydrochloric acid without effervescence.

Uses.—Arsenical antidote; for preparation of iron salts.

FERRI HYDROXIDUM CUM MAGNESII OXIDO. (Fer'-i hi-droks'-id-um cum mag-ne'-ze-i oks'-id-o.) **Ferri hydroxidi cum magnesii oxido. Ferric hydroxide with magnesium oxide.**

Uses.—Arsenical antidote. **Dose, 120 Cc.**

FERRI HYPOPHOSPHIS. (Fer'-i hi-po-fos'-fis.) **Ferri hypophosphi'tis. Ferric hypophosphite.**

White, or greyish-white powder, nearly tasteless.

Sol.—Slight in water, more readily in the presence of hypophosphorous acid.

Inc.—See ferri chloridum and acidum hypophosphorosum.

Uses.—Hematinic, tonic. **Dose, 0,20 Gm.**

Prep.—**Syrupus hypophosphitum compositus.** (0,225%.) **Dose, 8 Cc.**

FERRI IODIDUM. Ferrous iodide. (Unof.)

Prep.—1. **Syrupus ferri iodidi.** (5%.) **Dose, 1 Cc.**

2. **Pilulae ferri iodidi.** (0,06 Gm. in each.) **Dose, 2 pills.**

FERRI PHOSPHAS SOLUBILIS. (Fer'-i fos'-fas sol-u'-bil-is.) **Ferri phospha'tis solubilis. Soluble Ferric phosphate.**

Thin, bright green, transparent scales, having an acidulous, slightly saline taste.

Sol.—Freely and completely in water (owing to presence of free sodium citrate); insoluble in alcohol.

Inc.—1. **Mineral acids** precipitate ferric phosphate.

2. **Fixed alkali hydrates** precipitate ferric hydrate.

Uses.—Hematinic. **Dose. 0.25 Gm.**

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FERRI PYROPHOSPHAS SOLUBILIS. (Fer'-i pi-ro-fos'-fas sol-u'-bil-is.) **Ferri pyrophospha'tis solubilis. Soluble ferric pyrophosphate.**

Thin, apple-green, transparent scales, odorless, and having an acidulous, slightly saline taste, and a slightly acid reaction.

Sol.—Freely in water (owing to the presence of free sodium citrate); insoluble in alcohol.

Inc.—See ferri phosphas solubilis.

Uses.—Hematinic. **Dose, 0,25 Gm.**

FERRI SULPHAS. (Fer'-i sul'-fas.) **Ferri sulpha'tis. Ferrous sulphate.** Syn.—Green vitriol. Copperas.

Large, pale bluish-green monoclinic prisms, without odor, and having a saline, styptic taste.

Sol.—In 0.9 of water, insoluble in alcohol.

Inc.—1. Precipitated by **alkali hydrates, carbonates, phosphates, sulphides, ferrocyanides, ferricyanides, borax, tannic acid, gallic acid.** The alkali citrates dissolve many of these precipitates.

2. Ferrous salts are reducing agents; and oxidized to ferric salts by **oxidizing agents,** even by exposure to the air.

Uses.—Deodorant. astringent, hematinic. **Dose, 0,20 Gm.**

Prep.—**Ferri sulphas exsiccatus.** (100 reduced to 65 parts.) **Dose, 0,125 Gm.**

Ferri sulphas granulatus. Dose, 0,20 Gm.

Adm.—The exsiccated sulphate in pills.

FERRI TERSULPHAS. Ferric sulphate. (Unof.)

Prep.—**Liquor ferri tersulphatis.** (36%.) Used in preparation of other iron salts.

FERRI SUBSULPHAS. Ferric subsulphate. (Unof.) Syn.—Monsel's salt.

Prep.—**Liquor ferri subsulphatis. Dose, 0,2 Cc.** Mixible with water and alcohol. Used as styptic.

FERRUM (Fer'-um.) **Ferri. Iron.**

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FERRUM REDUCTUM. (Fer'-um re-dukt'-um.) **Ferri Reducti. Reduced Iron.** Syn.—Quevenne's iron. Iron by Hydrogen.

A very fine, grayish-black lustreless powder, strongly attracted by the magnet, without odor or taste.

Sol.—Insoluble in water or alcohol.

Inc.—1. **Acids** dissolve it, forming salts.

2. It is a reducing agent; incompatible with all **oxidizing agents**; with the most powerful of which it is liable to produce explosion on dry trituration.

Uses.—Hematinic. **Dose, 0,065 Gm.**

Adm.—In pills, capsules, or lozenges.

FICUS. (Fi'-kus.) **Fici. Fig.**

The partially dried fruit of *Ficus carica.*

Comp.—Sugar; (62%); gum; fat; and **salts.**

Uses.—Laxative, nutritive.

FLUIDEXTRACTA. See p. 126.

FOENICULUM. (Fen-ik'-u-lum.) **Foeniculi. Fennel.**

The dried, nearly ripe fruit of *Foeniculum vulgare.*

An elongated, nearly cylindrical, yellowish- or brownish-green fruit, smooth, with exception of five prominent, light-colored ribs. Odor and taste aromatic, anise-like.

Comp.—Volatile oil, etc.

Uses.—Stomachic, carminative, emmenagogue. **Dose, 1 Gm.**

Prepared from fennel by distillation:

Oleum foeniculi, a volatile oil. **Dose, 0,2 Cc.**

Prep.—**Aqua foeniculi. Dose, 16 Cc.**

FORMALDEHYDUM. (Form-al-de-hi'-dum.) **Formaldehydi.**

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Inc.—**Fixed alkalies; ammonia; oxidizing agents, gelatin; tannin.**

Uses.—Antiseptic (1%); disinfectant (5%).

FRANGULA. (Frang'-gu-lah.) **Frangulæ. Frangula.** Syn.—Buckthorn. The dried bark of *Rhamnus frangula.*

Thin bark in rolled quills, externally grayish-brown to purplish black, with small transverse whitish cork-warts, inner surface pale yellow. Odor distinct; taste somewhat aromatic, sweetish, and bitter.

Comp.—A glucoside, frangulin, which in the old bark has become converted into emodin (which is also found in rhubarb).

Uses.—Cathartic. **Dose, 1 Gm.**

Prep.—**Fluidextractum frangulæ. Dose, 1 Cc.**

Adm.—Fluidextract with aromatic elixir.

GALLA. (Gal'-ah.) **Gallæ. Galla.** Syn.—Nutgall.

An excrescence on *Quercus infectoria,* caused by the punctures and deposited ova of *Cynips tinctoria.*

Round, hard, nodulated bodies, about 2 Cm. in diameter, dark colored; often with a round hole. Nearly inodorous; taste strongly astringent.

Comp.—Tannic acid, 50 to 60%; gallic acid, 2 to 3%, etc.

Inc.—See acidum tannicum.

Uses.—Astringent. **Dose, 0,50 Gm.**

Prep.—1. **Tinctura gallæ.** (20%.) **Dose, 4 Cc.**

2. **Unguentum gallæ.** (20%.)

GAMBIR. (Gam'-bir.) **Gambir. Gambir.** Syn.—Catechu. Cutch.

An extract prepared from the leaves and twigs of *Ourouparia gambir.*

Brown masses; inodorous; taste bitterish, very astringent, with a sweetish aftertaste.

Comp.—Catechutannic acid (36 to 40%), the active principle; converted by boiling or by the saliva into catechin, which is probably inactive.

Inc.—See acidum tannicum.

Uses.—Astringent. **Dose, 1 Gm.**

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Prep.—1. **Tinctura gambir composita.** (5%.) **Dose, 4 Cc.**
2. **Trochisci gambir.** (0,06 Gm. each.)

GELATINUM. (Jel-at-i'-num.) **Gelatini. Gel'atin.**
The purified, air-dried product of the hydrolysis of certain animal tissues, as skin, ligaments, and bones, by treatment with boiling water.
An amorphous, more or less transparent solid, usually shredded or in thin sheets; colorless or with a slight yellowish tint, inodorous, and having a slight, characteristic, almost insipid taste.
Sol.—Insoluble in cold water, but swells and softens when immersed in it. It is soluble in boiling water; the solution (1 in 50), unless heated for too long a time, solidifies on cooling, and forms a transparent jelly. It is also soluble in acetic acid, and glycerin; insoluble in alcohol, ether, chloroform, benzene, carbon disulphide, and fixed and volatile oils.
Inc.—Its aqueous solution is precipitated by **tannic acid, picric acid, mercuric chloride, formaldehyde,** and, of course, **alcohol.**
Uses.—Hemostatic, nutritive, demulcent, protective, vehicle.
Prep.—**Gelatinum glycerinatum.** (50%.)

GELSEMIUM. (Gel-se'-me-um.) **Gelsemii. Gelsemium.** Syn.—Yellow jasmine. The dried rhizome and roots of *Gelsemium sempervirens.*
Thick, cylindrical, branching rhizome and roots, externally light yellowish-brown, with purplish-brown longitudinal lines; internally pale-yellow; odor pronounced, characteristic; taste slightly aromatic, bitter.
Comp.—Two alkaloids: gelsemine and gelseminine; gelseminic acid; volatile oil.
Uses.—Antispasmodic, antineuralgic. **Dose, 0,065 Gm.**
Prep.—1. **Fluidextractum gelsemii. Dose, 0,05 Cc.**
2. **Tinctura gelsemii.** (10%.) **Dose, 0,50 Cc.**
Adm.—The tincture, with compound tincture of cardamom and syrup of orange (equal parts).

GENTIANA. (Jen-she-a'-nah.) **Gentianæ. Gen'tian.**
The dried root of *Gentiana lutea.*

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Dark-brown roots, transversely annulate above, the lower portion longitudinally wrinkled; odor strong characteristic; taste sweetish and persistently bitter.

Comp.—The bitter glucoside, gentiopicrin; combined with gentisic acid. A sugar, gentianose; and volatile oil are also present.

Inc.—Though this drug does not contain tannic acid, its preparations are incompatible with iron salts, as they cause darkening of the liquid.

Uses.—Simple bitter stomachic. **Dose, 1 Gm.**

Prep.—1. **Extractum gentianæ. Dose, 0,25 Gm.**
2. **Fluidextractum gentianæ. Dose, 1 Cc.**
3. **Tinctura gentianæ composita.** (10%.) **Dose, 4 Cc.**

Adm.—The compound tincture of gentian is a most elegant preparation.

GERANIUM. (Je-ra'-ne-um.) **Geranii. Geranium.** Syn.—Cranesbill.

The dried rhizome of *Geranium maculatum.*

Rather short, compact, tuberculated, brown rhizome; odor slight, taste strongly astringent.

Comp.—Tannic acid (15 to 25%); gallic acid; pectin, etc.

Inc.—Those of tannic acid.

Uses.—Astringent. **Dose, 1 Gm.**

Prep.—**Fluidextractum geranii. Dose, 1 Cc.**

GLANDULAE SUPRARENALES SICCAE. (Gland'-u-le su-prah-re-na'-les sik'-e.) **Glandula'rum suprarenalium sicca'rum. Desiccated suprare'nal glands.** Syn.—Suprarenal extract. The cleaned, dried, and powdered suprarenal glands of the sheep or ox, freed from fat.

A light, yellowish-brown, amorphous powder, having a slight, characteristic odor.

Sol.—Partially soluble in water.

Comp.—Epinephrin, or adrenalin, the active principle is a yellowish-white crystalline powder, of mildly bitter taste, slightly soluble in cold water; readily soluble in most diluted acids or alkalies.

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Uses.—Local vaso-constrictor; circulatory stimulant. **Dose, 0,25 Gm.**

Adm.—In capsules; or tablets.

GLANDULAE THYROIDEAE SICCAE. (Gland′-u-le thi-roid-e′-e sik′-e.) **Glandula′rum thyroidea′rum sicca′rum. Desiccated thyroid glands.** Syn.—Thyroid extract. The cleaned, dried, and powdered thyroid glands of the sheep.

A yellowish, amorphous powder, having a slight, peculiar odor.

Sol.—Partially soluble in water.

Comp.—The chief active principle seems to be iodothyrin, or thyroidin, a proteid containing 9.5% of iodine.

Uses.—Alterative in myxedema, cretinism, goitre, obesity. **Dose, 0,25 Gm.**

Adm.—In capsules; or tablets.

GLYCERINUM. (Glis-er-i′-num.) **Glycerini. Glyc′erin.** Glycerol.

A clear, colorless liquid, of a thick, syrupy consistence; odorless; very sweet and slightly warm to the taste. It is hygroscopic.

Sol.—Mixible with water or alcohol; also soluble in a mixture of 3 of alcohol and 1 of ether; insoluble in ether, chloroform, carbon disulphide, benzene, petroleum benzin, and fixed and volatile oils.

Inc.—Glycerin is a reducing agent; hence, incompatible with **oxidizing agents.** If triturated with dry oxidizing agents, explosion is liable to result.

Uses.—Antiseptic; depletant; emollient; laxative; solvent. **Dose, 4 Cc.**

Prep.—**Suppositoria glycerini.** (3 Gm. in each.)

GLYCERITA. See p. 95.

GLYCYRRHIZA. (Glis-ir-i′-zah.) **Glycyrrhizæ. Glycyrrhiza.** Syn.—Liquorice root. The dried rhizome and root of *Glycyrrhiza glabra.*

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Comp.—Glycyrrhizin (about 6%), an amorphous yellow glucoside, which with acids yields glucose and glycyrrhetin, a bitter substance. There are also present: glycyramin; asparagin; an acrid resin; starch.

Inc.—See Glycyrrhizinum ammoniatum.

Uses.—Demulcent, sweetening agent. **Dose, 2 Gm.**

Prep.—1. **Extractum glycyrrhizæ. Dose, 1 Gm.**

2. **Extractum glycyrrhizæ purum. Dose, 1 Gm.**
3. **Fluidextractum glycyrrhizæ. Dose, 2 Cc.**
4. **Elixir adjuvans.** (Fluidextract 12%.) **Dose, ad lib.**
5. **Pulvis glycyrrhizæ compositus.** (23.6%.) **Dose, 4 Gm.** (Its active ingredient is senna.)
6. **Mistura glycyrrhizæ composita.** (Ext. 3%.) **Dose, 8 Cc.** (Its active ingredients are wine of antimony and camphorated tincture of opium.)
7. **Trochisci glycyrrhizæ et opii.**

GLYCYRRHIZINUM AMMONIATUM. (Glis-ir-iz-i′-num am-o-ne-a′-tum.) **Glycyrrhizini ammoniati. Ammon′iated glycyrrhi′zin.**

The active glucosidal principle of glycyrrhiza combined with ammonium.

Dark-brown or reddish-brown scales, without odor, and having a very sweet taste.

Sol.—Readily soluble in water and in alcohol.

Inc.—1. Decomposed and precipitated by **mineral acids.**

2. Ammonia liberated by **free alkalies.**
3. Precipitates solutions of the **salts of many of the heavy metals.**

Uses.—Sweetening agent. **Dose, 0,25 Gm.**

GOSSYPII CORTEX. (Gos-ip′-e-i kor′-teks.) **Gossypii corticis. Cotton root bark.** The dried bark of the root of the cotton plant. (*Gossypium herbaceum.*)

Thin flexible bands or quilled pieces; outer surface brownish-yellow; inner surface whitish; odor faint; taste slightly astringent and acrid.

Comp.—Resin; fixed oil; tannic acid; coloring matter.

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Uses.—Emmenagogue; uterine hemostatic. (?) **Dose, 2 Gm.**

GOSSYPIUM PURIFICATUM. (Gos-ip'-e-um pur-if-ic-a'-tum.) **Gossypii purificati. Purified cotton.** Syn.—Absorbent cotton.

The hairs of the seed of the cotton plant (*Gossypium herbaceum.*)

Minute white filaments, tasteless and odorless, insoluble.

Uses.—As surgical dressing, etc.

GRANATUM. (Gran-a'-tum.) **Granati. Pomegranate.** The bark of the stem and root of *Punica granatum.*

Small brittle quills or curved pieces, externally yellowish- to brownish-gray; internally grayish-yellow to brownish; odor distinct; taste astringent, somewhat bitter.

Comp.—Four alkaloids, the most important of which is pelletierine, or punicine (½%), a volatile oily alkaloid soluble in water, alcohol, ether, chloroform; the other alkaloids are known as methyl- pseudo- and isopelletierine. There is also present punicotannic acid (20%).

Inc.—**Alkalies, metallic salts,** and **gelatin.**

Uses.—Anthelmintic against tape-worm. **Dose, 2 Gm.**

Prep.—**Fluidextractum granati. Dose, 2 Cc.**

Adm.—The fluidextract or a decoction are quite unpalatable; while the isolated active principle is easily administered and more certain in action. See Pelletierinæ tannas.

GRINDELIA. (Grin-de'-le-ah.) **Grindeliæ. Grindelia.** The dried leaves and flowering tops of *Grindelia robusta* or *G. squarrosa.*

Leaves sessile, spatulate to lanceolate; compound flower-head with yellow ray-florets and disc-florets; odor balsamic; taste pungently aromatic and bitter.

Comp.—Resin; volatile oil; probably alkaloid, grindeline.

Uses.—Expectorant. **Dose, 2 Gm.**

Prep.—**Fluidextractum grindeliæ. Dose, 2 Cc.**

Adm.—The fluidextract of grindelia with fluidextract of glycyrrhiza and syrup of tolu.

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GUAIACOL. (Gwi'-ak-ol.) **Guaiaco'lis. Guaiacol.**

Either a clear, colorless, oily fluid, or a colorless crystalline solid, which melts at 28° C. (83° F.), having an agreeable, aromatic odor.

Sol.—53 of water; 1 of glycerin; in all proportions of alcohol or ether.

Inc.—Similar to creosote (q. v.).

Uses.—Antiseptic, expectorant, especially in tuberculosis. **Dose, 0,50 Gm.**

Adm.—In capsules with expressed oil of almond.

GUAIACOLIS CARBONAS. (Gwi-ak-o'-lis kar'-bon-as.) **Guaiacolis carbona'tis. Guai'acol carbonate.**

A white crystalline powder, almost odorless and tasteless.

Sol.—Insoluble in water; 48 of alcohol; 1.5 of chloroform; 13 of ether; readily in benzene; slightly soluble in glycerin and fatty oils.

Uses.—Like those of guiacol. **Dose, 1 Gm.**

Adm.—In powders, capsules, or pills.

GUAIACUM. (Gwi'-ak-um.) **Guaiaci. Guaiac.**

The resin of the wood of *Guaiacum officinale* or of *Guaiacum sanctum.*

Irregular brittle masses, greenish-brown to reddish-brown; odor balsamic; taste slightly acrid.

Sol.—Almost insoluble in water; soluble in alcohol, ether, chloroform, acetone, and solutions of alkalies.

Inc.—Its alcoholic solution is colored blue by **oxidizing agents.**

Uses.—Diaphoretic; diuretic; alterative in gout. **Dose, 1 Gm.**

Prep.—1. **Tinctura guaiaci.** (20%.) **Dose, 4 Cc.**

2. **Tinctura guaiaci ammoniata.** (20%.) **Dose, 2 Cc.**

Adm.—As the tinctures have a disagreeable taste, they are best administered, emulsified by mucilage of acacia, in cinnamon water, sweetened with syrup.

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Usually in cylindrical, hard, reddish-brown sticks, showing fragments of seeds; odor slight; taste astringent, somewhat smoky and pleasantly bitter, then sweetish.

Comp.—Guaranine (at least 3.5% by assay) identical with caffeine; volatile oil; saponin; tannic acid.

Uses.—Against headaches; also in atonic chronic diarrhea. **Dose, 2 Gm.**

Prep.—**Fluidextractum guaranæ. Dose, 2 Cc.**

Adm.—Fluidextract in aromatic elixir.

HAEMATOXYLON. (Hem-at-oks'-il-on.) **Hæmatoxyli. Hematoxylon.** Syn.—Logwood. The heart-wood of *Hæmatoxylon campechianum.*

Reddish-brown chips, of faint, agreeable odor, and sweetish, astringent taste.

Comp.—Tannic acid; hæmatoxylin (12%), a sweet, colorless crystalline substance, producing a beautiful dark violet color by the joint action of alkali and oxygen, becoming converted into hæmatein, which is also present in extracts.

Inc.—Those of tannic acid.

Uses.—Astringent.

Prep.—**Extractum hæmatoxyli. Dose, 1 Gm.**

Adm.—In decoction; or aqueous solution of extract.

HAMAMELIDIS CORTEX. (Ham-am-e'-lid-is kor'-teks.) **Hamamelidis corticis. Hamame'lis bark.** Syn.—Witch-hazel bark. The bark and twigs of *Hamamelis virginiana.*

Irregularly quilled or bent pieces of bark, with grayish-brown cork; inner surface pale cinnamon-colored. Twigs yellowish-brown to deep purplish-brown externally; wood greenish-white. Odor faint; taste astringent, somewhat bitter and pungent.

Comp.—Tannic acid (8%); bitter principle; resin.

Uses.—Astringent. **Dose, 2 Gm.**

Prep.—**Aqua hamamelidis. Dose, 8 Cc.**

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Obliquely ovate or oval, large leaves with coarsely sinuate margin; odor slight; taste astringent, slightly aromatic and bitter.

Comp.—Tannic acid, bitter principle, etc.

Uses.—Astringent. **Dose, 2 Gm.**

Prep.—**Fluidextractum hamamelidis foliorum. Dose, 2 Cc.**

Adm.—The fluidextract in aromatic elixir.

HEDEOMA. (He-de-o′-mah.) **Hedeomæ. Hedeoma.** Syn.—Pennyroyal.

The dried leaves and flowering tops of *Hedeoma pulegioides.*

Branchlets quadrangular, hairy, with small oblong-ovate leaves, and small pale-blue two-lipped flowers; odor strong, somewhat mint-like; taste aromatic, pungent.

Comp.—Volatile oil.

Uses.—Carminative, emmenagogue. **Dose, 8 Gm.**

Prepared by distillation: **Oleum hedeomæ,** a volatile oil. **Dose, 0,2 Cc.**

HEXAMETHYLENAMINA. (Heks-ah-meth-il-en-am-i′-nah.) **Hexamethylenaminæ. Hexamethylenamine.** Syn.—Urotropin.

A condensation product obtained by the action of ammonia upon formaldehyde.

Colorless, lustrous, odorless crystals, of a sweetish, afterwards bitter taste.

Sol.—1.5 of water; 10 of alcohol; 228 of ether.

Inc.—Decomposed by **all acids** in the presence of warmth.

Uses.—Urinary antiseptic. **Dose, 0,25 Gm.**

Adm.—In capsules, powders, or aqueous solution, to be taken with a tumblerful of water or carbonated water.

HOMATROPINAE HYDROBROMIDUM. (Hom-at-ro-pi′-ne hi-dro-bro′-mid-um.) **Homatropinæ hydrobromidi. Homatropine hydrobromide.**

A white, odorless, crystalline powder, having a bitter taste.

Sol.—5.7 of water; 32.5 of alcohol; 620 of chloroform; insoluble in ether.

Inc.—Similar to those of atropine. (See atropina.)

Uses.—Mydriatic. **Dose, 0,0005 Gm.**

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Adm.—1/5 to 2% aqueous solution dropped into conjunctival sac.

HUMULUS. (Hu'-mu-lus.) **Humuli. Hops.**

The carefully dried strobiles of *Humulus lupulus.*

An oval, yellowish-green fruit-cone, consisting of many membranous scales, enclosing a small light-brown fruit; the latter as well as the enveloping scales should be thickly beset with minute brownish-red glands, in which the active principles reside; and which, when separated, constitute the drug called Lupulin (q. v.). Odor strongly aromatic; taste, bitter aromatic, and slightly astringent.

Comp.—Valerol, a volatile oil (1%); resin (9 to 18%); lupulinic acid (11%), a bitter crystalline principle; tannic acid (3 to 4%).

Inc.—**Mineral acids,** and **metallic salts.**

Uses.—Bitter stomachic; mildly narcotic. **Dose, 2 Gm.**

Adm.—Mainly in form of lupulin (q. v.).

HYDRARGYRI CHLORIDUM CORROSIVUM. (Hi-drar'-jar-i klo'-rid-um kor-o-si'-vum.) **Hydrargyri chloridi corrosivi. Corro'sive mercuric chloride.** Syn.—Corrosive sublimate. Mercuric bichloride. Corrosive chloride of mercury. Mercuric chloride.

Heavy, colorless, rhombic crystals or crystalline masses, odorless, and having an acrid and persistent metallic taste.

Sol.—When in fine powder, in 13 parts of water, 3 parts of alcohol, and in about 14 parts of glycerin.

Inc.—1. Aqueous solutions are precipitated by: **alkali hydrates** and **carbonates, sulphides, phosphates.**

2. Soluble **iodides** and **bromides** precipitate corresponding mercuric salts, soluble in excess, so that usually these combinations are permissible.

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pyrine, gelatin; and coagulates **albumin.** It is almost universally incompatible.

Uses.—Disinfectant, antiseptic, antisyphilitic, antiphlogistic. **Dose, 0,003 Gm.**

Adm.—In pill (with sugar of milk); or in solution in compound tincture of gentian; or in compound tincture of cardamom; or water sweetened with syrup.

HYDRARGYRI CHLORIDUM MITE. (Hi-drar′-jir-i klo′-rid-um mi′-te.) **Hydrargyri chloridi mitis. Mild mercurous chloride.** Syn.—Mild chloride of mercury. Calomel. Subchloride of mercury.

A white, impalpable powder, without odor or taste.

Sol.—Insoluble in water, alcohol, or ether, and also in cold dilute acids.

Inc.—1. **Alkalies,** some **alkaloids** (cocaine), **antipyrine, soap,** convert calomel into a black compound. Bicarbonate of sodium produces this change very slowly.

2. **Iodides, bromides** and **cyanides** convert the mercurous chloride into mercury and mercuric salt, which, being more soluble, is more poisonous.

3. **Reducing agents** change it to metallic mercury.

4. **Oxidizing agents** convert it into mercuric compound.

Uses.—Cholagogue, purgative, antisyphilitic, diuretic. **Dose,** (laxative), **0,125 Gm.** (alterative), **0,065 Gm.**

Prep.—**Pilulæ catharticæ compositæ** (0,06 in each). **Dose, 2 pills.**

Adm.—Mixed with sugar of milk, or sodium bicarbonate in powder, tablet, or pill.

HYDRARGYRI IODIDUM FLAVUM. (Hi-drar′-jir-i i-od′-id-um fla′-vum.) **Hydrargyri iodidi flavi. Yellow mercurous iodide.** Syn.—Mercury protiodide. Yellow mercury iodide. Green mercury iodide.

A bright yellow, amorphous powder, odorless and tasteless.

Sol.—Almost insoluble in water, and wholly insoluble in alcohol or ether.

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Inc.—1. Solutions of **iodides** form mercuric iodide and mercury.

2. It is reduced to mercury by **reducing agents**; and oxidized to mercuric salt by **oxidizing agents.**

Uses.—Antisyphilitic. **Dose, 0,01 Gm.**

Adm.—In pills.

HYDRARGYRI IODIDUM RUBRUM. (Hi-drar′-jir-i i-od′-id-um rub′-rum.) **Hydrargyri iodidi rubri. Red mercuric iodide.** Syn. Mercury biniodide. Red iodide of mercury.

A scarlet, amorphous powder, odorless and tasteless.

Sol.—Almost insoluble in water, soluble in 116 parts of alcohol, 85 of ether, and 1340 of chloroform, also in solutions of the soluble iodides, mercuric chloride, sodium thiosulphate, and hot solutions of the alkali chlorides.

Inc.—See hydrargyri chloridum corrosivum.

Uses.—Alterative in skin diseases and in syphilis. **Dose, 0,003 Gm.**

Prep.—**Liquor arseni et hydrargyri iodidi. Dose, 0,1 Cc.**

Adm.—In pill (with sugar of milk); or dissolved by means of potassium iodide in water sweetened with flavoring syrup, e. g., compound syrup of sarsaparilla, or syrup of ginger.

HYDRARGYRI NITRAS. (Unofficial.)

Prep.—1. **Liquor hydrargyri nitratis. Used externally.**

2. **Unguentum hydrargyri nitratis.**

HYDRARGYRI OXIDUM FLAVUM. (Hi-drar′-jir-i oks′-id-um fla′-vum.) **Hydrargyri oxidi flavi. Yellow mercuric oxide.**

A light orange-yellow, amorphous, heavy, impalpable powder, having a somewhat metallic taste. It has the same

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HYDRARGYRI OXIDUM RUBRUM. (Hi-drar′-jir-i oks′-id-um rub′-rum.) **Hydrargyri oxidi rubri. Red mercuric oxide.** Syn.—Red precipitate.

Heavy, orange-red, crystalline scales, or a crystalline powder, having a somewhat metallic taste.

Sol.—Almost insoluble in water; insoluble in alcohol.

Inc.—Completely soluble in dilute hydrochloric or nitric acid; combining with **acids** to form salts.

Uses.—Alterative, especially in skin diseases.

Prep.—**Unguentum hydrargyri oxidi rubri.** (10%.)

HYDRARGYRUM. (Hi-drar′-jir-um.) **Hydrargyri. Mercury.** Syn.—Quicksilver.

A shining, silver-white metal, without odor or taste, and easily divisible into small globules.

Sol.—Insoluble in the ordinary solvents, but it dissolves in sulphuric acid when boiled with it, and is completely soluble in nitric acid.

Uses.—In fine subdivision: antisyphilitic; laxative; sorbefacient.

Adm.—In the following forms:

Prep.—1. **Hydrargyrum cum creta.** Mercury with chalk. Syn.—Gray powder. (38%.) **Dose, 0.25 Gm.**

2. **Massa hydrargyri,** Mass of mercury. Syn.—Blue mass. Blue pill. (33%.) **Dose, 0,25 Gm.**

3. **Unguentum hydrargyri.** Mercurial ointment. (50%.)

4. **Unguentum hydrargyri dilutum.** Blue ointment. (Mercurial ointment, 67%.)

5. **Emplastrum hydrargyri.** Mercurial plaster. (30%.)

HYDRARGYRUM AMMONIATUM. (Hi-drar′-jir-um am-o-ne-a′-tum.) **Hydrargyri ammoniati. Ammoniated mercury.** Syn.—White precipitate. Mercuric ammoniochloride.

White, pulverulent pieces, or a white, amorphous powder, having an earthy, afterwards styptic and metallic taste.

Sol.—Insoluble in water or alcohol; readily soluble in

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warm hydrochloric, nitric or acetic acid, and in a cold solution of ammonium carbonate.

Inc.—1. Decomposed by solutions of **fixed alkali hydrates** or **lime water.** 2. On trituration with **iodine,** gas (nitrogen iodide) is evolved; in the presence of alcohol suddenly and with explosive violence.

Uses.—Parasiticide; local stimulant.

Prep.—**Unguentum hydrargyri ammoniati.** (10%.)

HYDRASTINA. (Hi-dras-ti'-na.) **Hydrastinae. Hydras'tine.** A colorless alkaloid obtained from hydrastis. White to creamy white, glistening prisms, sometimes of large size, possessing a bitter taste.

Sol.—Almost insoluble in water; soluble in 135 of alcohol, 124 of ether and in 2 of chloroform.

Inc.—See alkaloids.

Uses.—Uterine hemostatic. **Dose, 0,01 Gm.**

Adm.—In pills.

HYDRASTININAE HYDROCHLORIDUM. (Hi-dras-tin-i'-ne hi-dro-klo'-rid-um.) **Hydrastininae hydrochloridi. Hydras'tinine hydrochloride.** The hydrochloride of an artificial alkaloid derived from hydrastine.

Light yellowish needles, or a pale yellow, crystalline powder, odorless, and having a bitter taste; deliquescent on exposure to damp air.

Sol.—Very soluble in water and in alcohol.

Inc.—See alkaloids.

Uses.—Uterine hemostatic; locally, alterative in catarrh. **Dose, 0.03 Gm.**

Adm.—In aqueous solution. May be used hypodermically; or locally. (1/5 to 1% solution.)

HYDRASTIS. (Hi-dras'-tis.) **Hydrastis. Hydrastis.** Syn.—Golden seal. The dried rhizome and roots of *Hydrastis canadensis.*

Small, thin, knotty rhizomes, bright-yellow within, with many brittle rootlets; odor slight; taste bitter.

Comp.—Hydrastine, a colorless alkaloid, (2.5% by assay); berberine, a yellow alkaloid; and canadine, in white needles.

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Inc.—See alkaloids.

Uses.—Bitter tonic and alterative, especially locally in catarrhs. **Dose, 2 Gm.**

Prep.—1. **Fluidextractum hydrastis. Dose, 2 Cc.**
2. **Glyceritum hydrastis.** (100%.) **Dose, 2 Cc.**
3. **Tinctura hydrastis.** (20%.) **Dose, 4 Cc.**

Adm.—The tincture or the fluidextract may be prescribed with aromatic elixir; the glycerite with flavoring syrup and water.

HYOSCINAE HYDROBROMIDUM. (Hi-os-i′-ne hi-dro-bro′-mid-um.) **Hyoscinae hydrobromidi. Hy′oscine hydrobromide.**

Colorless, transparent, rhombic crystals, odorless, and having an acrid, slightly bitter taste.

Sol.—In 1.5 of water, in 16 of alcohol, in 750 of chloroform; insoluble in ether.

Inc.—See alkaloids.

Uses.—Hypnotic, mydriatic, antispasmodic.

Dose, 0,0005 Gm.

Adm.—With sugar of milk in pills. In aqueous solution with flavoring syrup, e. g., syrup of orange. Also used hypodermically.

HYOSCYAMINAE HYDROBROMIDUM. (Hi-o-si-am-i′-ne hi-dro-bro′-mid-um.) **Hyoscyaminae hydrobromidi, Hyoscy′amine hydrobromide.**

A yellowish, amorphous, resin-like mass, or white, prismatic crystals, having, particularly when damp, a tobacco-like odor, and an acrid, nauseous, and bitter taste; deliquescent on exposure to air.

Sol.—Very soluble in water; soluble in 2 of alcohol; 1600 of ether; 250 of chloroform.

Inc.—See atropina.

Uses.—Hypnotic, mydriatic, antispasmodic.

Dose, 0,0005 Gm.

Adm.—With sugar of milk in pills. In aqueous solution with flavoring syrup, e. g., syrup of orange.

HYOSCYAMINAE SULPHAS. (Hi-o-si-am-i′-ne sul′-fas.) **Hyoscyaminae sulpha′tis. Hyoscy′amine sulphate.**

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White, indistinct crystals, or a white powder, odorless, having a bitter, acrid taste; deliquescent in damp air.

Sol.—Very soluble in water; soluble in 6.4 of alcohol, 2500 of ether, and 2300 of chloroform.

Inc.—See atropina.

Uses.—Hypnotic, mydriatic, antispasmodic.

Dose, 0,0005 Gm.

Adm.—With sugar of milk in pills. In aqueous solution with flavoring syrup, e. g., syrup of orange.

HYOSCYAMUS. (Hi-o-si'-am-us.) **Hyoscyami. Hyoscyamus.**

Syn.—Henbane. The dried leaves and flowering tops of *Hyoscyamus niger.*

Stems long, cylindrical, hairy; leaves gray-green, hairy, irregularly lobed; flowers or capsules within persistent calyx; odor heavy, narcotic; taste somewhat bitter and nauseous.

Comp.—The alkaloids hyoscyamine and hyoscine.

Inc.—See atropina.

Uses.—Hypnotic, mydriatic, antispasmodic. **Dose, 0,25 Gm.**

Prep.—1. **Extractum hyoscyami. Dose, 0,065 Gm.**

2. **Fluidextractum hyoscyami. Dose, 0,20 Cc.**

3. **Tinctura hyoscyami.** (10%.) **Dose, 1,00 Cc.**

Adm.—Extract for solid medicament. Tincture the best liquid preparation, which may be disguised by aromatic elixir, or flavoring syrup, e. g., syrup of tolu.

INFUSA. See p. 110.

IODOFORMUM. (I-o-do-for'-mum.) **Iodoformi. Io'doform.**

Small lemon-yellow, lustrous crystals, or a fine lemon-yellow powder, having a peculiar, very penetrating and persistent odor somewhat resembling that of saffron and iodine, and an unpleasant, slightly sweetish, and iodine-like taste. When exposed to sunlight it becomes oxidized and decomposed.

Sol.—In 9391 parts of water, to which it imparts its odor and taste; in 46.7 parts of alcohol, in 5.2 parts of ether, soluble in chloroform, and fixed and volatile oils. Slightly soluble in petroleum benzin.

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Inc.—1. Heated with **alkali hydrate** solution it is decomposed into iodide and formate. 2. Mixture with **calomel** turns red on exposure to sunlight owing to formation of red mercuric iodide. 3. **Silver nitrate** decomposes it; on dry trituration with explosive violence. 4. **Tannic acid** slowly deodorizes and decomposes it. 5. **Balsam of Peru** deodorizes it, combining with the iodoform.

Uses.—Antiseptic dusting powder. **Dose, 0,25 Gm.**

Prep.—**Unguentum iodoformi.** (10%.)

Adm.—It is difficult to disguise its odor; probably the best agent for this purpose is cumarin (unoff.), the odorous principle of tonka bean. This is the agent used in the preparation of aromatized iodoform of the National Formulary (iodoformum aromatizatum, N. F.), which contains 4% of cumarin. Volatile oils, such as those of peppermint, cloves, cinnamon, sassafras, may be used if cumarin is not available. For internal administration iodoform is best dispensed in capsules.

IODOLUM. (I-o'-dol-um.) **Io'doli. I'odol.** Syn.—Pyrrol tetriodide.

A light grayish-brown crystalline powder, without odor or taste.

Sol.—In about 4900 of water; 9 of alcohol; 1.5 of ether; 105 of chloroform; soluble in fixed oils.

Uses.—Antiseptic dusting powder. **Dose, 0,25 Gm.**

IODUM. (I-o'-dum.) **Iodi. I'odine.**

Heavy, bluish-black, dry and friable rhombic plates, having a metallic lustre, a distinctive odor, and a sharp and acrid taste.

Sol.—5000 of water; 10 of alcohol; freely in ether, chloroform, carbon disulphide, or aqueous solutions of iodides.

Inc.—Iodine is an oxidizing agent; it is **almost universally incompatible.**

Uses.—Irritant, antiseptic, absorbent, alterative. **Dose, 0,005 Gm.**

Prep.—1. **Liquor iodi compositus.** (5%.) **Dose, 0,2 Cc.**
2. **Tinctura iodi.** (7%.) **Dose, 0,1 Cc.**
3. **Unguentum iodi.** (4%.)

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Adm.—For internal use, the compound solution, in aromatic water (e. g., cinnamon water), to be freely diluted before administration.

IPECACUANHA. (Ip-e-kak-u-an'-ah.) **Ipecacuanhae. Ip'-ecac.** The dried root of *Cephaëlis ipecacuanha* or *Cephaëlis acuminata.*

Small root composed of thin, tough, whitish wood, with thick, irregularly annulated, reddish-brown bark, often transversely fissured and easily removable from the wood; odor very slight, peculiar; taste bitter, nauseous, somewhat acrid.

Comp.—The alkaloids, emetine (not less than 2% on assay), and Cephaëline. Also present: cephaëlic acid, tannic acid, volatile oil, starch, etc.

Inc.—See alkaloids.

Uses.—Expectorant, stomachic, cholagogue, diaphoretic. **Dose, 0,065 Gm.** Emetic: **Dose, 1 Gm.**

Prep.—1. **Fluidextractum ipecacuanhae. Dose,** expectorant, **0,05 Cc.**; emetic, **1,00 Cc.**

2. **Vinum ipecacuanhae.** (Fluidextract, 10%.) **Dose, 1 Cc.**
3. **Syrupus ipecacuanhae.** (7%.) Contains acetic acid. **Dose,** expectorant, **1 Cc.**; emetic, **15 Cc.**
4. **Pulvis ipecacuanhae et opii.** (10%.) **Dose, 0,50 Gm.**
5. **Tinctura ipecacuanhae et opii.** (10%.) **Dose, 0,50 Cc.**

Adm.—For pills, use powdered ipecac. The liquid preparations may be rendered more pleasant by admixture of flavoring syrup. Powder of ipecac and opium may be prescribed in pills, capsules, or powders; the last mentioned made more pleasant by addition of powdered cinnamon and sugar.

JALAPA. (Jal-a'-pah.) **Jalapae. Jal'ap.** The dried tuberous root of *Exogonium purga.*

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Large, hard, irregularly round or pear-shaped, dark-brown tubers; slight, peculiar smoky odor; taste sweetish and acrid.

Comp.—Resin (8% on assay), consisting mostly of the glucoside jalapurgin, a hard substance insoluble in ether; and jalapin, a soft resin (not more than 1.5%), soluble in ether; the latter being less active than the former.

Uses.—Drastic hydragogue cathartic. **Dose, 1 Gm.**

Prep.—1. **Resina jalapae. Dose, 0,125 Gm.**

2. **Pulvis jalapae compositus.** (35%.) **Dose, 2 Gm.**

Adm.—Resin, in pills.

KAOLINUM. (Ka-o-li'-num.) **Kaolini. Ka'olin.** Syn.—Fuller's earth. Porcelain clay. Aluminum silicate.

A soft, white or yellowish-white powder, odorless, having an earthy taste.

Sol.—Insoluble in water, and in cold dilute solutions of acids or alkalies.

Uses.—Simple dusting powder.

Prep.—**Cataplasma kaolini.**

KINO. (Ki'-no.) **Kino. Kino.** The inspissated juice of *Pterocarpus marsupium.*

Small, angular, dark brownish-red, shining pieces, brittle, inodorous, very astringent and sweetish.

Sol.—Slowly soluble in cold water; soluble in alcohol; nearly insoluble in ether.

Comp.—Kinotannic acid, (75%); kinoin, a neutral principle; pyrocatechin; kino red; etc.

Inc.—Those of tannic acid.

Uses.—Astringent. **Dose, 0,50 Gm.**

Prep.—**Tinctura kino.** (5%.) **Dose, 4 Cc.**

Adm.—Tincture in aromatic water, e. g., cinnamon water.

KRAMERIA. (Kra-me'-re-ah.) **Krameriae. Krameria.** Syn.—Rhatany. The dried root of *Krameria triandra* and other species of Krameria.

Knotty, branched, red-brown root; inodorous; of very astringent taste.

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Comp.—Kramerotannic acid, (20%); rhatanin; rhatanic red.

Inc.—Those of tannic acid.

Uses.—Astringent. **Dose, 1 Gm.**

Prep.—1. **Extractum krameriae. Dose, 0,50 Gm.**

2. **Fluidextractum krameriae. Dose, 1 Cc.**

3. **Tinctura krameriae.** (20%.) **Dose, 4 Cc.**

4 **Syrupus krameriae.** (Fluidextract, 45%.) **Dose, 4 Cc.**

5. **Trochisci krameriae.** (0,06 Gm. in each.)

Adm.—The tincture may be administered with flavoring syrup, e. g., syrup of orange.

LACTUCARIUM. (Lak-tu-ka'-re-um.) **Lactucarii. Lactucarium.** The concrete milk-juice of the lettuce, *Lactuca virosa.*

Brownish, somewhat porous masses of opium-like odor and bitter taste.

Comp.—Lactucerin, a crystalline principle, about 50%; lactucin, a bitter principle; lactucic acid.

Sol.—Partly soluble in alcohol and in ether.

Uses.—Feeble hypnotic, anodyne, antispasmodic. **Dose, 1 Gm.**

Prep.—1. **Tinctura lactucarii.** (50%.) **Dose, 2 Cc.**

2. **Syrupus lactucarii.** (Tinct., 10%. Contains citric acid, 0,1%.) **Dose, 8 Cc.**

LAPPA. (Lap'-ah.) **Lappae. Lappa.** Syn.—Burdock. The dried root of *Arctium lappa* and other species of Arctium.

Fleshy, cylindrical, wrinkled root, externally grayish-brown, wood yellowish, porous; odor slight; taste mucilaginous, sweetish, and slightly bitter.

Comp.—Inulin; mucilage; bitter principle; tannic acid, small quantity; resin.

Uses.—Diaphoretic, diuretic. **Dose, 2 Gm.**

Prep.—**Fluidextractum lappae. Dose, 2 Cc.**

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Branched, flattened, blackish-brown rhizome with long, thin, fragile rootlets; odor slight; taste bitter, feebly acrid.

Comp.—Leptandrin, a bitter, crystalline glucoside.

Uses.—Cholagogue cathartic. **Dose, 1 Gm.**

Prep.—1. **Extractum leptandrae. Dose, 0,25 Gm.**
2. **Fluidextractum leptandrae. Dose, 1 Cc.**
3. **Pilulae catharticae vegetabiles.** (Extract, **0,015 Gm.** in each.)

LIMONIS CORTEX. (Li-mo'-nis kor'-teks.) **Limonis corticis. Lemon peel.** The recently separated outer rind of the ripe fruit of *Citrus limonum.*

Outer surface lemon-yellow, the tissue beneath containing numerous large oil reservoirs; odor highly fragrant; taste pungently aromatic.

Comp.—Volatile oil; hesperidin, a bitter principle.

Uses.—Flavoring agent.

Prep.—**Tinctura limonis corticis.** (50%.)

Prepared by expression: **Oleum limonis,** a volatile oil. **Dose, 0,2 Cc.**

LIMONIS SUCCUS. (Li-mo'-nis suk'-us.) **Limonis succi. Lemon juice.** The freshly expressed juice of the ripe fruit of *Citrus limonum.*

A slightly turbid, yellowish liquid, having the odor of lemon; taste acid and often slightly bitter.

Comp.—Citric acid (7%); malic acid; phosphoric acid.

Inc.—Those of citric acid. See acidum citricum.

Uses.—Antiscorbutic; flavoring agent. **Dose, 30 Cc.**

Adm.—With sugar as lemonade.

LINIMENTA. See p. 174.

LINUM. (Li'-num.) **Lini. Linseed.** Flaxseed. The seed of the common flax. (*Linum usitatissimum.*) Small, flat, oblong brown seeds.

Comp.—Fixed oil and mucilage.

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LIQUORES. See p. 79.

LITHII BENZOAS. (Lith'-e-i ben'-zo-as.) **Lithii benzoa'tis. Lithium benzoate.**

A light, white powder, or small, shining, crystalline scales; odorless, or of a faint benzoin-like odor, and of a cooling, sweetish taste; permanent in the air.

Sol.—3 of water; 13 of alcohol.

Inc.—See lithii bromidum, and sodii benzoas.

Uses.—Antiseptic, diuretic. **Dose, 1 Gm.**

Adm.—In aqueous solution, sweetened with flavoring syrup, e. g., syrup of orange.

LITHII BROMIDUM. (Lith'-e-i bro'-mid-um.) **Lithii bromidi. Lithium bromide.**

A white, granular salt, odorless, having a sharp and slightly bitter taste; very deliquescent.

Sol.—0.6 of water; very soluble in alcohol; soluble in ether.

Inc.—1. Those of bromides. (See acidum hydrobromicum.) 2. Those of lithium. The soluble lithium salts are incompatible with **carbonates** and **phosphates.**

Uses.—Sedative nervine. **Dose, 1 Gm.**

Adm.—Like lithium benzoate (q. v.); or with compound tincture of cardamom, to which a few drops of spirit of chloroform might be added.

LITHII CARBONAS. (Lith'-e-i kar'-bon-as.) **Lithii carbona'tis. Lithium carbonate.**

A light, white powder, odorless, and having an alkaline taste.

Sol.—In 75 parts of water; insoluble in alcohol; soluble, with active effervescence in dilute acids.

Inc.—See Lithii bromidum and potassii carbonas.

Uses.—Alkaline diuretic. **Dose, 0,50 Gm.**

Adm.—In powders; preferably taken in carbonated water.

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A white powder, or colorless crystals, odorless, and having a cooling, faintly alkaline taste; deliquescent on exposure to moist air.

Sol.—2 of water; almost insoluble in alcohol.

Inc.—See Lithii bromidum and sodii citras.

Uses.—Diuretic. **Dose, 0,50 Gm.**

Prep.—**Lithii citras effervescens.** (5%.) **Dose, 8 Gm.**

Adm.—In aqueous solution, sweetened with flavoring syrup, e. g., syrup of citric acid.

LITHII SALICYLAS. (Lith'-e-i sal-is'-il-as.) **Lithii salicyla'tis. Lithium salicylate.**

A white, or grayish-white powder, odorless, and having a sweetish taste; deliquescent on exposure to the air.

Sol.—Very soluble in water and in alcohol.

Inc.—(a) The soluble **carbonates** and **phosphates,** which precipitate the lithium in form of the corresponding salt. (b) Those of salicylates. (See acidum salicylicum.)

Uses.—Antirheumatic. **Dose, 1 Gm.**

Adm.—In aqueous solution, sweetened with flavoring syrup, e. g., syrup of orange.

LOBELIA. (Lo-be'-le-ah.) **Lobeliae. Lobelia.** Syn.—Indian tobacco. The dried leaves and tops of *Lobelia inflata.*

Leaves alternate, pale-green, pubescent; stem coarsely angled, hairy, terminating in long racemes of pale-blue flowers; capsules inflated, containing numerous minute seeds; odor slight, irritating; taste strongly acrid.

Comp.—Lobeline, a volatile liquid alkaloid; lobelic acid; and lobelacrin, which is probably lobeline lobelate.

Inc.—Those of alkaloids; especially **caustic alkalies**

Uses.—Antiasthmatic, expectorant. **Dose, 0,5 Gm.**

Prep.—1. **Fluidextractum lobeliae. Dose, 0,5 Cc.**

2. **Tinctura lobeliae.** (10%.) **Dose,** expectorant, **1 Cc.**; emetic, **4 Cc.**

Adm.—Tincture with flavoring syrup, e. g., syrup of citric acid.

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LUPULINUM. (Lu-pu-li'-num.) **Lupulini. Lupulin.** The glandular trichomes separated from the fruit of *Humulus lupulus.* (See humulus.)

A bright, brownish-yellow granular powder, having the characteristic odor and taste of hops.

Comp., inc., and uses.—See humulus. **Dose, 0,50 Gm.**

Prep.—1. **Fluidextractum lupulini. Dose, 1 Cc.**

2. **Oleoresina lupulini. Dose, 0,20 Gm.**

Adm.—Lupulin in capsules or pills. The oleoresin, with powdered glycyrrhiza, in form of pill.

LYCOPODIUM. (Li-ko-po'-de-um.) **Lycopodii. Lycopodium.** Spores of the Club-moss, *(Lycopodium clavatum.)*

A pale yellow, very mobile powder, odorless, tasteless, insoluble.

Uses.—Simple dusting powder.

MAGNESII CARBONAS. (Mag-ne'-ze-i kar'-bon-as.) **Magnesii carbona'tis. Magnesium carbonate.**

Light, white, friable masses, or a bulky, white powder, without odor, and having a slightly earthy taste; permanent in the air.

Sol.—Practically insoluble in water, to which, however, it imparts a slightly alkaline reaction; insoluble in alcohol.

Inc.—Dilute **acids** dissolve it with effervescence.

Uses.—Antacid; laxative. **Dose, 3 Gm.**

Prep.—**Liquor magnesii citratis. Dose, 360 Cc.**

Adm.—In powder, to be taken mixed with water or milk.

MAGNESII OXIDUM. (Mag-ne'-ze-i oks'-id-um.) **Magnesii oxidi. Magnesium oxide.** Syn.—Calcined magnesia. Light magnesia.

A white, very bulky and fine powder, without odor, and having an earthy, but not a saline taste. On exposure to air it slowly absorbs moisture and carbon dioxide.

Sol.—Almost insoluble in water; insoluble in alcohol.

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Inc.—1. Dilute **acids** dissolve it. 2. Gelatinous mass is formed when magnesia is allowed to stand with 15 times its weight of **water** (formation of hydrate); or with 16 times its weight of **copaiba** (formation of magnesium copaivate).

Uses.—Antacid; laxative. **Dose, 2 Gm.**

Adm.—In powder, to be taken mixed with water or milk.

MAGNESII OXIDUM PONDEROSUM. (Mag-ne'-ze-i oks'-id-um pon-der-o'-sum.) **Magnesii oxidi ponderosi. Heavy magnesium oxide.**

A white, dense and very fine powder, which should correspond to the tests for magnesia, from which it differs in not readily uniting with water to form a gelatinous hydroxide.

Inc., uses, and adm.—Same as magnesium oxide (q. v.) **Dose, 2 Gm.**

MAGNESII SULPHAS. (Mag-ne'-ze-i sul'-fas.) **Magnesii sulpha'tis. Magnesium sulphate.** Syn.—Epsom salt.

Small, colorless, rhombic prisms or prismatic needles, odorless, and having a cooling, saline, and bitter taste.

Sol.—In 0.85 of water; insoluble in alcohol.

Inc.—(a) Soluble magnesium salts in concentrated aqueous solution are precipitated by **soluble hydrates** and **carbonates** (excepting ammonium hydrate or carbonate), by **phosphates, arsenates, sulphites, oxalates, tartrates.** (b) Those of sulphates. (See acidum sulphuricum.)

Uses.—Hydragogue purgative. **Dose, 16 Gm.**

Prep.—**Magnesii sulphas effervescens.** (50%.) **Dose, 16 Gm.**

Adm.—Above preparation in ice cold lemonade.

MALTUM. (Mawl'-tum.) **Malti. Malt.** Syn.—Byne.

The grain of barley, partially germinated artificially, and then dried.

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Yellowish to brown grains; crisp when fractured; the interior surface whitish, or tinged with brown; has an agreeable, characteristic odor, and a sweet taste.

Comp.—Maltose; dextrin; some diastase; etc.

Uses.—Demulcent, nutritive. Used in form of:

Prep.—**Extractum malti. Dose, 16 Cc.**

MANGANI DIOXIDUM PRAECIPITATUM. (Man'-gan-i di-oks'-id-um pre-sip-it-a'-tum.) **Mangani dioxidi praecipitati. Precipitated manganese dioxide.** Syn. Black manganese oxide.

A heavy, very fine, black powder, without odor or taste.

Sol.—Permanent in the air; insoluble in water or alcohol.

Uses.—Emmenagogue. **Dose, 0,25 Gm.**

Adm.—In pills, capsules, or powders.

MANGANI HYPOPHOSPHIS. (Man'-gan-i hi-po-fos'-fis.) **Mangani hypophosphi'tis. Manganese hypophosphite.**

A pink, crystalline powder, odorless, and nearly tasteless.

Sol.—6,6 of water; almost insoluble in alcohol.

Inc.—See mangani sulphas and acidum hypophosphorosum.

Uses.—Tonic. **Dose, 0,20 Gm.**

Prep.—**Syrupus hypophosphitum compositus.** (0,225%.) **Dose, 8 Cc.**

MANGANI SULPHAS. (Man'-gan-i sul'-fas.) **Mangani sulpha'tis. Manganese sulphate.** Syn.—Manganous sulphate.

Colorless, or pale rose-colored, translucent, tetragonal prisms, odorless, and having a slightly bitter and astringent taste.

Sol.—In about 0,7 of water; insoluble in alcohol.

Inc.—Salts of manganese in aqueous solution are precipitated by fixed **alkali hydrates, carbonates, phosphates, cyanides.**

Uses.—Hematinic. **Dose, 0,25 Gm.**

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In irregular, more or less elongated, flattish, three-sided pieces; externally yellowish-white; friable, somewhat waxy; internally whitish, porous and crystalline; odor suggestive of maple sugar; taste sweet, slightly bitter and faintly acrid.

Comp.—Mannite (50 to 80%), a sweet crystalline principle.

Sol.—In water.

Uses.—Laxative. **Dose, 16 Gm.**

MARRUBIUM. (Mar-u'-be-um.) **Marrubii. Marrubium.** Syn.—Horehound. The dried leaves and flowering tops of *Marrubium vulgare.*

Quadrangular, hairy branches; leaves opposite, hairy; pale-blue flowers in dense, axillary, wooly whorls; odor distinct, rather agreeable; taste somewhat aromatic and bitter.

Comp.—Marrubiin, a bitter principle; volatile oil, small amount; resin.

Uses.—Stomachic; feeble diuretic; diaphoretic. **Dose, 2 Gm.**

Adm.—Infusion; confection.

MASSAE. See p. 149.

MASTICHE. (Mas'-ti-ke.) **Mastiches. Mastic.**

In subglobular, lenticular, elongated or pear-shaped tears, about 3 mm. in diameter, pale yellow or greenish-yellow, transparent, having a glass-like lustre, the surface sometimes very slightly dusty; brittle; becoming plastic when chewed; of a weak, balsamic odor and a mild terebinthinate taste.

Sol.—Completely in ether and almost completely in alcohol.

Uses.—Mild local stimulant. **Dose, 2 Gm.**

Prep.—**Pilulae aloes et mastiches.** See aloes.

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Long, lanceolate, brownish-green leaves, the under surface with a very prominent midrib and deeply reticulate; odor peculiar; taste aromatic, spicy, and bitterish.

Comp.—Volatile oil (2,5%); pungent resin; bitter principle; arthanthic acid; tannic acid.

Uses.—Stimulant blennorrhotic. **Dose, 4 Gm.**

Prep.—**Fluidextractum matico. Dose, 4 Cc.**

MATRICARIA. (Mat-rik-a'-re-ah.) **Matricariae. Matricaria.** Syn.—German chamomile. The dried flower-heads of *Matricaria chamomilla.*

Compound flower head with conical hollow receptacle, 12 to 18 white ray-florets, and many deep yellow disk-florets; odor somewhat disagreeably aromatic, taste strongly aromatic and bitter.

Comp.—Volatile oil; anthemic acid; anthemidin, probably a glucoside; tannic acid.

Uses.—Carminative, diaphoretic. **Dose, 16 Gm.**

Adm.—Infusion.

MEL. See p. 87.

MELLITA. See p. 87.

MENTHA PIPERITA. (Men'-thah pi-per-i'-tah.) **Menthae piperitae. Peppermint.** The dried leaves and flowering tops of *Mentha piperita.*

Branches quadrangular with scattered hairs; leaves nearly smooth; purplish flowers in obtuse spikes: odor strong and characteristic; taste pungent and cooling.

Comp.—Volatile oil; menthol.

Uses.—Stomachic, carminative, flavoring agent. **Dose, 4 Gm.**

Prepared from it by distillation: **Oleum menthae piperitae.** A volatile oil, containing menthol (50 to 65%), and menthene. **Dose, 0,2 Cc.**

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MENTHA VIRIDIS. (Men'-thah vir'-id-is.) **Menthae viridis. Spearmint.** The dried leaves and flowering tops of *Mentha spicata.*

Closely resembling peppermint; but flower spikes slender; odor and taste resembling, but distinguishable from those of peppermint.

Comp.—Volatile oil; resin; gum; etc.

Uses.—Same as peppermint. **Dose, 4 Gm.**

Prepared from spearmint by distillation: **Oleum menthae viridis,** a volatile oil; composed of menthene and carvol, a stearopten isomeric with thymol. **Dose, 0,2 Cc.**

Prep.—1. **Aqua menthae viridis. Dose, 16 Cc.**

2. **Spiritus menthae viridis.** (10%.) **Dose, 2 Cc.**

MENTHOL. (Men'-thol.) **Men'tholis. Menthol.** A secondary alcohol obtained from peppermint.

Colorless acicular or prismatic crystal, of strong peppermint odor, and a warm, aromatic taste, followed by a sensation of cold, when air is drawn into the mouth.

Sol.—Slightly soluble in water, imparting to it its odor and taste; freely soluble in alcohol, ether, and chloroform.

Inc.—1. Softening or liquefaction occurs when menthol is triturated with **camphor, thymol, phenol, naphthol, resorcinol, chloral hydrate, ethyl carbamate.**

2. Decomposed by strong **oxidizing agents.**

Uses.—Antiseptic; local analgesic; and those of peppermint. **Dose, 0,065 Gm.**

Adm.—Externally as pigment in ether or chloroform. As spray in liquid petrolatum (1 to 10%). Internally in pills (with powdered soap); capsules; or in alcoholic solution, dropped on sugar.

METHYLIS SALICYLAS. (Meth'-il-is sal-is'-il-as.) **Methylis salicyla'tis. Methyl salicylate.** Syn.—Artificial (or synthetic) oil of wintergreen.

A colorless liquid, having a characteristic, strongly aromatic odor, and a sweetish, warm, and aromatic taste.

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Sol.—Sparingly in water; soluble in all proportions in alcohol, glacial acetic acid, or carbon disulphide.

Inc.—1. Decomposed by **alkali hydrates.**

2. With **ferric salts,** deep violet color. See **acidum salicylicum.**

Uses.—Antirheumatic. **Dose, 1 Cc.**

Adm.—On sugar, in capsules, or in emulsion. **Also externally by inunction.**

METHYLTHIONINAE HYDROCHLORIDUM. (Meth-il-thi-o-ni′-ne hi-dro-klo′-rid-um.) **Methylthioninae hydrochloridi. Methylene blue.**

A dark green, crystalline powder, or in the form of prismatic crystals having a bronze-like lustre.

Sol.—Readily in water, and somewhat less readily in alcohol, the solution having a deep blue color.

Inc.—1. Decomposed by strong solution of **potassium hydrate.**

2. **Potassium iodide** and **potassium bichromate** form precipitate.

3. **Sulphuric acid** changes color to green.

4. **Reducing agents** cause formation of colorless substance.

Uses.—Antimalarial; analgesic; sedative. **Dose, 0,25 Gm.**

Adm.—In pills or capsules, usually combined with half its weight of powdered nutmeg.

MEZEREUM. (Mez-e′-re-um.) **Mezerei. Mezereum.** The dried bark of *Daphne mezereum,* and other species of Daphne.

Long, thin, flexible bands, yellowish on outer and silky-white on inner surface; odor slight; taste very acrid.

Comp.—Mezerein, an acrid resin; an acrid volatile oil; daphnin, a bitter glucoside; coccogin, a bitter principle.

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MORPHINA. (Mor-fi'-nah.) **Morphinae. Mor'phine.** An alkaloid obtained from opium.

Colorless, or white, shining, rhombic prisms, or fine needles, or a crystalline powder, odorless, and having a bitter taste.

Sol.—In 3330 of water, 100 of lime water, 168 of alcohol, 4464 of ether, 1800 of chloroform, 113,5 of amyl alcohol, and in 525 of acetic ether; insoluble in benzene.

Inc.—1. Morphine is precipitated from solutions of its salts by the **general alkaloidal precipitants** (see alkaloids); by **lead subacetate, potassium chromate, potassium cyanide, codeine.**

2. Morphine is a reducing agent; it is incompatible with **oxidizing agents,** producing color reactions with many: With **nitric acid,** red to yellow; with **silver nitrate,** red; **spirit of nitrous ether,** yellow; **ferric chloride,** blue; with **chlorine,** orange.

Uses.—See opium. **Dose, 0,01 Gm.**

Adm.—In form of its salts, because of their greater solubility.

MORPHINAE ACETAS. (Mor-fi'-ne as-e'-tas.) **Morphinae aceta'tis. Morphine acetate.**

A white, or yellowish-white, crystalline or amorphous powder, having a faintly acetous odor, and a bitter taste.

Sol.—In 2,25 of water; in 21,6 of alcohol; 480 of chloroform, and 5,2 of glycerin; insoluble in ether.

Inc.—See morphine.

Uses.—See opium. **Dose, 0,015 Gm.**

Adm.—See morphinae sulphas.

MORPHINAE HYDROCHLORIDUM. (Mor-fi'-ne hi-dro-klo'-rid-um.) **Morphinae hydrochloridi. Morphine hydrochloride.**

White, silky, glistening needles, or microcrystalline cubes, or a white crystalline powder, odorless, and having a bitter taste.

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Sol.—In 17,2 parts of water; in 42 of alcohol; insoluble in ether and in chloroform.

Inc.—See morphina.

Uses.—See opium. **Dose, 0,015 Gm.**

Adm.—See morphinae sulphas.

MORPHINAE SULPHAS. (Mor-fi'-ne sul'-fas.) **Morphinae sulpha'tis. Morphine sulphate.**

White, feathery, acicular, silky crystals, or in cubical masses; odorless, and having a bitter taste.

Sol.—In 15,3 of water; 465 of alcohol; insoluble in ether and chloroform.

Inc.—See morphina.

Uses.—See opium. **Dose, 0,015 Gm.**

Prep.—**Pulvis morphinae compositus.** (1,5%.) **Dose, 0,50 Gm.**

Adm.—In pill (with sugar of milk); or in aqueous solution with syrup of orange to disguise taste; or in aqueous solution hypodermically.

MOSCHUS. (Mos'-kus.) **Moschi. Musk.** The dried secretion obtained from the follicles of the prepuce of the musk-deer. (*Moschus moschiferus.*)

In irregular, crumbly, somewhat unctous grains, dark reddish-brown, having a peculiar, penetrating and persistent odor, and a bitterish taste.

Comp.—Ammonia; acid; gelatinous and albuminous principles; and fats. The odoriferous principle is probably a product of decomposition, being constantly formed.

Sol.—From 50 to 75% of musk is soluble in water, the solution being deep brown, faintly acid, and strongly odorous. About 10 to 12% of musk is soluble in alcohol, the solution being light brownish-yellow, and on the addition of water becoming slightly turbid.

Uses.—Antispasmodic, general stimulant. **Dose, 0,25 Gm.**

Prep.—**Tinctura moschi.** (5%.) **Dose, 4 Cc.**

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MUCILAGINES. See p. 88.

MYRISTICA. (Mi-ris'-tik-ah.) **Myristicae. Myristica.** Syn. —Nutmeg. The kernel of the ripe seed of *Myristica fragrans.*

Large, oval, light brown, reticulately furrowed; odor strongly aromatic; taste aromatic, warm, and slightly bitter.

Comp.—Volatile oil (2 to 8%); fixed oils (25 to 30%); starch; etc.

Uses.—Flavoring agent, carminative. **Dose, 0,50 Gm.**

Prepared from nutmeg by distillation: **Oleum myristicae.** A volatile oil. **Dose, 0,2 Cc.**

MYRRHA. (Mur'-ah.) **Myrrhae. Myrrh.** A gum-resin obtained from Commiphora myrrha.

In roundish or irregular tears or masses of brownish color; of balsamic odor; aromatic, bitter, and acrid taste.

Comp.—Myrrhin, a resin (23%); myrrhol, a volatile oil (2 to 4%); gum (60%); bitter principle.

Sol.—Triturated with water, it yields a brownish-yellow emulsion; alcohol dissolves the resin, leaving the gum.

Uses.—Antiseptic; stimulant to mucous membranes; carminative; expectorant; emmenagogue (with aloes). **Dose, 0,5 Gm.**

Prep.—1. **Tinctura myrrhae.** (20%.) **Dose, 1 Cc.**

2. **Tinctura aloes et myrrhae.** (10%.) **Dose, 2 Cc.**

3. **Pilulae aloes et myrrhae.** (0,06 Gm. in each.) **Dose, 2 pills.**

Adm.—In pill, powder, or suspended in aqueous mixture. Tincture used externally.

NAPHTHALENUM. (Naf-thal-e'-num.) **Naphthaleni. Naph'thalene.** Syn.—Naphthalin

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Sol.—Insoluble in water; soluble in 13 of alcohol; **very** soluble in ether, chloroform, carbon disulphide, **and** fixed or volatile oils.

Inc.—1. Liquefaction results on trituration with **phenol,** or **phenyl salicylate.**

2. **Nitric acid, chlorine, bromine,** combine with it.

Uses.—Antiseptic. **Dose, 0,125 Gm.**

Adm.—In capsules or cachets. Oil of bergamot (oleum bergamottæ, unoff.) probably disguises its odor best.

NUX VOMICA. (Nuks vom'-ik-ah.) **Nucis vomicae. Nux vomica.** Syn.—Poison nut. Dog button. The dried, ripe seed of *Strychnos nux vomica.*

Rather large, round, flat discs, externally grayish or greenish-gray, covered with short satiny hairs; inodorous; taste intensely and persistently bitter.

Comp.—Two alkaloids, strychnine (not less than 1.25% on assay) and brucine (1 to 1.5%); united with isaguric acid.

Inc.—See strychnina.

Uses.—Stomachic; motor excitant; circulatory and respiratory stimulant. **Dose, 0,065 Gm.**

Prep.—1. **Extractum nucis vomicae. Dose, 0,015 Gm.**

2. **Fluidextractum nucis vomicae. Dose, 0,05 Cc.**

3. **Tinctura nucis vomicae.** (10%.) **Dose, 0,6 Cc.**

Adm.—The extract in pills. The tincture is the best liquid preparation; may be given with aromatic syrup, e. g., syrup of orange. For prompt general effect use salt of strychnine hypodermically. (See strychnina.)

OLEATA. See p. 176.

OLEORESINAE. See p. 132.

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Inc.—1. With solutions of **alkali hydrates**, and the **oxides of many metals**, they form soaps and glycerin.
2. They combine with **bromine** and **iodine**.
3. Give color reactions with **concentrated sulphuric acid** and **concentrated nitric acid**. With nitric acid or nitrous acid, olein of fixed oils forms a solid substance known as elaidin.

OLEA VOLATILIA. The volatile oils are very slightly soluble in water, imparting to it their odor and taste; they are soluble in alcohol, ether, chloroform, benzene, petroleum benzin, fixed oils and fats.

Inc.—1. **Potassium hydrate** saponifies the resinified portion.
2. Color reaction are obtained with **concentrated sulphuric acid** (generally yellow, turning brown); **concentrated nitric acid**; **ferric chloride** (with some).
3. **Iodine** and other oxidizing agents react violently, particularly with the hydrocarbon oils.

OLEUM ADIPIS. See p. 208.

OLEUM AETHEREUM. See p. 209.

OLEUM AMYGDALAE AMARAE. See p. 217.

OLEUM AMYGDALAE EXPRESSUM. (O'-le-um am-ig'-dal-e eks-pres'-um.) **Olei amygdalae expressi. Expressed oil of almond.**

A fixed oil expressed from bitter or sweet almond.

A clear, pale straw-colored or colorless oily liquid, almost inodorous, and having a mild, nut-like taste.

Sol.—Only slightly soluble in alcohol; mixible with ether, chloroform, and benzene.

Inc.—See Olea fixa.

Uses.—Emollient. **Dose, 30 Cc.**

OLEUM ANISI. See p. 218.

OLEUM AURANTII CORTICIS. See p. 225.

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OLEUM BETULAE. (O′-le-um bet′-u-le.) **Olei betulae. Oil of betula.** Syn.—Oil of sweet birch.

A volatile oil obtained by distillation from the bark of the sweet birch, *Betula lenta.* It is identical with methyl salicylate, and nearly identical with oil of gaultheria.

Sol., Inc., Uses, and Adm.—See methylis salicylas. **Dose, 1 Cc.**

OLEUM CADINUM. (O′-le-um ka-di′-num.) **Olei cadini. Oil of cade.** Syn.—Juniper tar oil.

A product of the dry distillation of the wood of *Juniperus oxycedrus.*

A brownish or dark-brown, clear, thick liquid, having a tarry odor, and an empyreumatic, burning, somewhat bitter taste.

Sol.—Almost insoluble in water; only partially soluble in alcohol; but completely soluble in ether.

Comp. and uses.—Similar to those of tar. (See pix liquida.)

OLEUM CAJUPUTI. (O′-le-um kaj-u-pu′-ti.) **Olei cajuputi. Oil of caj′uput.**

A volatile oil distilled from the fresh leaves and twigs of *Melaleuca leucadendron.*

A thin, colorless or greenish liquid, having a peculiar, agreeable, distinctly camphoraceous odor, and an aromatic, bitterish taste.

Sol. and inc.—See olea volitilia.

Comp.—Cineol, 55% on assay; terpineol; and several terpenes.

Uses.—Parasiticide, irritant, carminative. **Dose, 0,5 Cc.**

Adm.—In capsule, or pill (with soap and powdered glycyrrhiza.

OLEUM CARI. See p. 240.

OLEUM CARYOPHYLLI. See p. 240.

OLEUM CHENOPODII. (O′-le-um ken-o-po′-de-i.) **Olei chenopodii. Oil of chenopodium.** Syn.—Oil of American wormseed. A volatile oil distilled from *Chenopodium anthelminticum.* A thin, colorless or yellowish liquid, having a peculiar, penetrating, somewhat camphoraceous odor, and a pungent and slightly bitter taste.

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Sol. and inc.—See olea volatilia.
Uses.—Anthelmintic against round worm. **Dose, 0,2 Cc.**
Adm.—On sugar, or in emulsion.

OLEUM CINNAMOMI. (O′-le-um sin-am-o′-mi.) **Olei cinnamomi. Oil of cin′namon.** Oil of cassia. A volatile oil distilled from *Cassia cinnamon.*

A yellowish or brownish liquid, having the characteristic odor of cinnamon, and a sweetish, spicy, and burning taste.
Sol.—In 2 volumes of 70% alcohol.
Comp.—Cinnamic aldehyde (75% on assay); eugenol; in old oil, cinnamic acid.
Uses.—Flavoring agent, stomachic, carminative. **Dose, 0,05 Cc.**
Prep.—1. **Aqua cinnamomi. Dose, 16 Cc.**
2. **Spiritus cinnamomi.** (10%.) **Dose, 2 Cc.**

OLEUM COPAIBAE. See p. 253.

OLEUM CORIANDRI. See p. 253.

OLEUM CUBEBAE. See p. 255.

OLEUM ERIGERONTIS. (O′-le-um er-ij-er-on′-tis.) **Olei erigerontis. Oil of Eri′geron.** Syn.—Oil of fleabane.

A volatile oil distilled from the fresh, flowering herb of *Erigeron canadensis.*

A pale yellow, limpid liquid, becoming darker and thicker by age and exposure to the air, having a peculiar aromatic, persistent odor, and an aromatic, slightly pungent taste.
Sol. and inc.—See olea volatilia.
Uses.—Internal hemostatic. **Dose, 1 Cc.**
Adm.—In capsules, emulsions, or on sugar.

OLEUM EUCALYPTI. See p. 259.

OLEUM FOENICULI. See p. 266.

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A colorless liquid, having a characteristic, strongly aromatic odor, and a sweetish, warm, and aromatic taste.
Comp.—Chiefly methyl salicylate.
Sol. and inc.—See methylis salicylas.
Uses.—Antirheumatic. **Dose, 1 Cc.**
Prep.—**Spiritus gaultheriae.** (5%.) **Dose, 2 Cc.**
Adm.—On sugar, in capsules, or in emulsion. **Also** externally by inunction.

OLEUM GOSSYPII SEMINIS. (O′-le-um gos-ip′-e-i se′-minis.) **Olei gossypii seminis. Cotton seed oil.** A fixed oil expressed from the seed of *Gossypium herbaceum* or of other species of Gossypium.
A pale yellow, oily liquid, without odor, and having a bland, nut-like taste.
Sol.—Insoluble in water; slightly soluble in alcohol; readily soluble in ether, chloroform, or carbon disulphide.
Comp.—Olein, palmitin.
Inc.—See olea fixa.
Uses.—Nutrient, emollient. **Dose, 16 Cc.**

OLEUM HEDEOMAE. See p. 275.

OLEUM JUNIPERI. (O′-le-um ju-nip′-er-i.) **Olei juniperi. Oil of juniper.** A volatile oil distilled from the fruit of *Juniperus communis.*
A colorless, or faintly greenish-yellow liquid, having the characteristic odor of juniper, and a warm, aromatic, somewhat terebinthinate and bitterish taste.
Sol.—Almost insoluble in water; soluble in 10 volumes of 90% alcohol.
Comp.—Chiefly terpenes.
Inc.—See olea volatilia.
Uses.—Diuretic. **Dose, 0,2 Cc.**
Prep.—1. **Spiritus juniperi.** (5%.) **Dose, 2 Cc.**
2. **Spiritus juniperi compositus.** (0.4%.) **Dose, 8 Cc.**

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A colorless or yellowish liquid, having the fragrant odor of lavender flowers, and a pungent and bitterish taste.

Uses.—Mainly as flavoring agent. **Dose, 0,2 Cc.**

Prep.—1. **Spiritus lavandulae.** (5%.) **Dose, 2 Cc.**
2. **Tinctura lavandulae composita.** (0.8%.) **Dose, 2 Cc.**

OLEUM LIMONIS. See p. 287.

OLEUM LINI. See p. 287.

OLEUM MENTHAE PIPERITAE. See p. 294.

OLEUM MENTHAE VIRIDIS. See p. 295.

OLEUM MORRHUAE. (O′-le-um mor′-u-e.) **Olei morrhuae. Cod liver oil.** A fixed oil obtained from fresh livers of the cod fish. (*Gadus morrhua*), and other species of Gadus.

A pale yellow, thin, oily liquid of fishy odor and taste.

Comp.—Olein (70%); palmitin (25%); some stearin; free fatty acids; traces of iodine, bromine, phosphorus, cholesterin, trimethylamine, bile-salts.

Uses.—Nutrient tonic. **Dose, 16 Cc.**

Prep.—1. **Emulsum olei morrhuae.** (50%.) **Dose, 8 Cc.**
2. **Emulsum olei morrhuae cum hypophosphitibus.** (50%.) **Dose, 8 Cc.**

Adm.—In elastic gelatin capsules; emulsion (official); or floated on syrup, with tincture of sweet orange peel, aromatic elixir, or whisky on surface.

OLEUM MYRISTICAE. See p. 299.

OLEUM OLIVAE. (O′-le-um o-le′-ve.) **Olei olivae. Olive oil.** Syn.—Sweet oil. A fixed oil expressed from the ripe fruit of *Olea europoca.*

A pale yellow, or light greenish-yellow oily liquid, having a slight peculiar odor, and a nutty, oleaginous

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Comp.—Olein (72%); palmitin (28%); arachin.
Uses.—Emollient, demulcent, nutrient. **Dose, 30 Cc.**

OLEUM PICIS LIQUIDAE. See p. 319.

OLEUM PIMENTAE. See p. 318.

OLEUM RICINI. (O′-le-um ris′-in-i.) **Olei ricini. Castor oil.** A fixed oil expressed from the seed of *Ricinus communis.*

A pale yellowish or almost colorless, transparent, viscid liquid, having a faint, mild odor, and a bland, afterwards slightly acrid, and generally offensive taste.

Sol.—In an equal volume of alcohol, and in all proportions, in absolute alcohol, or in glacial acetic acid; also soluble in 3 times its volume of 92.5 per cent of alcohol.

Comp.—Ricinolein constitutes its chief bulk.
Inc.—See olea fixa.
Uses.—Purgative. **Dose, 16 Cc.**
Adm.—Soft capsules; floating between syrup and liquor; or with an equal part of glycerin and a few drops of oil of cloves, or cinnamon taken from an ice cold spoon, which chills it into a viscid mass.

OLEUM ROSAE. (O′-le-um ro′-se.) **Olei rosae. Oil of rose.** Syn.—Attar of rose. A volatile oil distilled from the fresh flowers of *Rosa damascena.*

A pale yellowish, transparent liquid, having the strong, fragrant odor of rose, and a mild, slightly sweetish taste.

Sol.—The addition of 70 per cent alcohol precipitates the paraffin hydrocarbons, but forms a clear solution with the other constituents of the oil.

Inc.—See olea volatilia.
Uses.—Flavoring agent.
Prep.—**Aqua rosae fortior. Dose, 8 Cc.**
Aqua rosae. Dose, 16 Cc.
Unguentum aquae rosae.

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A colorless or pale yellow, limpid liquid, having the characteristic, pungent odor of rosemary, and a warm, somewhat camphoraceous taste.

Sol.—In about one-half volume of 90 per cent alcohol.

Inc.—See olea volatilia.

Uses.—Flavoring agent especially for external preparations. **Dose, 0,2 Cc.**

OLEUM SABINAE. See p. 335.

OLEUM SANTALI. (O'-le-um san'-tal-i.) **Olei santali. Oil of santal.** Syn.—Oil of sandal wood.

A volatile oil distilled from the wood of *Santalum album.*

A pale yellow, somewhat thick liquid, having a peculiar, aromatic odor, and a pungent, spicy taste.

Comp.—Santalol, an alcohol, 90 per cent.

Inc.—See olea volatilia.

Uses.—Diuretic; blennorrhetic; and expectorant. **Dose, 0.5 Cc.**

Adm.—In capsules or emulsion.

OLEUM SASSAFRAS. See p. 339.

OLEUM SINAPIS VOLATILE. See p. 344.

OLEUM TEREBINTHINAE. (O'-le-um ter-e-bin'-thin-e.) **Olei terebinthinae. Oil of turpentine.** A volatile oil recently distilled from turpentine.

A thin, colorless liquid, having a characteristic odor and taste, both of which become stronger and less pleasant by age and exposure to the air. Dissolves resins (the solution forms varnish), wax, sulphur, phosphorus and iodine.

Sol.—Slightly in water, and in 3 times its volume of alcohol.

Comp.—A mixture of several isomeric hydrocarbons (terpenes).

Inc.—See olea volatilia.

Uses.—Rubefacient; carminative.

Prep.—1. **Linimentum terebinthinae.** (35%.)

2. **Oleum terebinthinae rectificatum. Dose, 1 Cc.**
Emulsum olei terebinthinae. (15%.) **Dose, 4 Cc.**

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Adm.—The rectified oil in capsules, in emulsion (official), or on sugar.

OLEUM THEOBROMATIS. (O′-le-um the-o-bro′-mat-is.) **Olei theobromatis. Oil of theobroma.** Syn.—Cacao butter. A fixed oil expressed from the roasted seeds of *Theobroma cacao.*

A yellowish-white solid, having a faint agreeable odor, and a bland, chocolate-like taste.

Sol.—Readily in ether, chloroform, or benzene; also soluble in 100 parts of cold absolute alcohol and in 20 parts of boiling absolute alcohol.

Comp.—Stearin; olein; theobromine, an alkaloid.

Inc.—See olea fixa.

Uses.—Suppository basis, emollient.

OLEUM THYMI. (O′-le-um thi′-mi.) **Olei thymi. Oil of thyme.** A volatile oil distilled from the leaves and flowering tops of *Thymus vulgaris.*

A colorless liquid, having a strong odor of thyme, and an aromatic, pungent, afterwards cooling taste.

Sol.—In half its volume of alcohol.

Comp.—The hydrocarbons, cymene and thymene.

Inc.—See olea volatilia.

Uses.—Diuretic; blennorrhetic; expectorant. **Dose, 0,2 Cc.**

OLEUM TIGLII. (O′-le-um tig′-le-i.) **Olei tiglii. Croton oil.** A fixed oil expressed from the seed of *Croton tiglium.*

A pale-yellow or brownish-yellow, somewhat viscid liquid, having a slight fatty odor, and a mild oily, afterwards acrid and burning taste.

Sol.—55 to 60 of alcohol; freely soluble in ether, chloroform, carbon disulphide, and in fixed or volatile oils.

Comp.—Crotonoleic acid, free and as glyceride; other fatty acids are also present.

Inc.—See olea fixa.

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OPIUM. (O'-pe-um.) **Opii. Opium.** The concrete milky exudation obtained by incising the unripe capsules of the poppy, *Papaver somniferum.*

Brown, gummy mass of strong narcotic odor, and bitter characteristic taste.

Comp.—At least 19 alkaloids, the most important of which are: Morphine (not less than 9% on assay), codeine, narceine, thebaine, and narcotine. Most of these alkaloids are combined with meconic acid, some with sulphuric acid; some are free. There are also present two neutral bodies, meconin and meconoiasin; essential oil; gum; resin; glucose, etc.

Sol.—It yields its virtues to water, alcohol, dilute acids; but not to ether.

Inc.—1. Those of morphine. See morphina. 2. With **zinc, copper,** and **arsenic** salts, **silver nitrate, lead acetate** and **subacetate, barium chloride** and **calcium chloride,** precipitates are formed consisting mainly of the meconates or sulphates. 3. With nearly neutral solution of **ferric salts,** a red color is produced (due to meconic acid).

Uses.—Anodyne; hypnotic; sedative; antidiarrheal; antibechic; antiemetic; diaphoretic (with ipecac). **Dose, 0,10 Gm.**

Modifications.—1. **Opii pulvis.** Powdered opium. Opium dried and reduced to a very fine powder. 12 to 12.5% of morphine. **Dose, 0,065 Gm.**

2. **Opium granulatum.** Granulated opium. Opium dried and reduced to a coarse powder. 12 to 12,5% of morphine. **Dose, 0,065 Gm.**

3. **Opium deodoratum.** Deodorized opium. Syn.—Denarcotized opium. Extracted with purified petroleum benzin and dried. 12 to 12.5% of morphine. **Dose, 0,065 Gm.**

From these official modifications of opium are obtained the following:

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Prep.—1. **Extractum opii. Dose, 0,03 Gm.**
2. **Tinctura opii.** (10%.) **Dose, 0,5 Cc.**
3. **Tinctura opii deodorati.** (10%.) **Dose, 0,5 Cc.**
4. **Vinum opii.** (10%.) **Dose, 0,5 Cc.**
5. **Acetum opii.** (10%.) **Dose, 0,5 Cc.**
6. **Tinctura ipecacuanhae et opii.** (10%.) **Dose, 0,5 Cc.**
7. **Pulvis ipecacuanhae et opii.** (10%.) **Dose, 0,5 Gm.**
8. **Tinctura opii camphorata.** (0,4%.) **Dose, 8 Cc.**
9. **Pilulae opii.** (0,065 Gm. each.) **Dose, 1 pill.**
10. **Trochisci glycyrrhizae et opii.** (0,005 Gm. in each.)
11. **Emplastrum opii.** (Ext. 6%.) Externally.

Official alkaloids—1. Morphina; and its salts (q. v.)
2. Codeina and its salts. (q. v.)

Adm.—Pulverized opium or the extract for pills. Deodorized opium for powders. The deodorized tincture and the camphorated tincture are the most agreeable liquid preparations. The taste of tincture of opium may be corrected by syrup of ginger. For prompt analgesic effect, use morphine salt hypodermically.

PANCREATINUM. (Pan-kre-at-i'-num.) **Pancreatini. Pan'creatin.** Syn.—Zymine. A mixture of the enzymes naturally existing in the pancreas of warm blooded animals, usually obtained from the fresh pancreas of the hog or the ox. Proved, when assayed, to be capable of converting not less than 25 times its own weight of starch into substances soluble in water.

A cream colored, amorphous powder, having a faint, peculiar, not unpleasant odor, and a somewhat meat-like taste.

Sol.—Slowly soluble in water, and containing not more than 10 per cent of substances insoluble in this solvent; insoluble in alcohol.

Comp. Amylopsin, myopsin, trypsin and steapsin.

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Adm.—Combined with equal part of sodium bicarbonate in powder, or capsules given before or during meals.

PARAFFINUM. (Par-af-i′-num.) **Paraffini. Par′affin.** A colorless, translucent mass, slightly greasy to the touch, odorless and tasteless.

Sol.—Insoluble in water or alcohol; readily soluble in ether, petroleum benzin, benzene, carbon disulphide, volatile oils, and in warm fixed oils.

Uses.—Emollient.

PARALDEHYDUM. (Par-al-de-hi′-dum.) **Paraldehydi. Paral′dehyde.**

A colorless, transparent liquid, having a strong, characteristic, but not unpleasant or pungent odor, and a burning and cooling taste.

Sol.—In 8 of water, freely in alcohol, ether, fixed or volatile oils.

Inc.—1. Resinified by **fixed alkali hydrates.** 2. Liberates iodine from iodides. 3. It is a strong reducing agent; incompatible with **oxidizers.**

Uses.—Hypnotic. **Dose, 2 Cc.**

Adm.—In capsules; or in solution in aromatic elixir.

PAREIRA. (Par-a′-rah.) **Pareirae. Pareira.** Syn.—Pareira brava. The dried root of *Chondrodendron tomentosum.*

Knotty, tortuous pieces with blackish-brown, warty, thin bark; wood yellowish or brownish-gray, in irregularly concentric circles; odor slight; taste bitter.

Comp.—The alkaloid buxine, identical with berberine; tannic acid.

Inc.—**Iodine, ferric** and **lead salts.**

Uses.—Diuretic. **Dose, 2 Gm.**

Prep.—**Fluidextractum pareirae. Dose, 2 Cc.**

Adm.—The fluidextract with flavoring syrup, e. g. syrup of orange.

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A light yellow, odorless. amorphous powder, having an astringent taste, and a weak acid reaction.

Sol.—In 235 of water, 12.6 of alcohol, 300 of ether; insoluble in chloroform; soluble in warm diluted acids.

Comp.—Punicine, iso-punicine, methyl-punicine, and pseudo-punicine.

Inc.—See alkaloids.

Uses.—Anthelmintic against tape worm. **Dose, 0.25 Gm.**

Adm.—In mixture with syrup; or in capsules.

PEPO. (Pe′-po.) **Pepo′nis. Pumpkin seed.** The ripe seed of *Cucurbita pepo.*

Rather large, oval, flat, whitish seeds; slightly odorous when contused; taste bland and oily.

Comp.—Fixed oil (44%); an acrid resin, probably the active principle; proteid; fatty acids; etc.

Uses.—Anthelmintic against tape-worm. **Dose, 30 Gm.**

Adm.—Emulsion with sugar in milk.

PEPSINUM. (Pep-si′-num.) **Pepsini. Pep′sin.** A proteolytic ferment or enzyme obtained from the glandular layer of the fresh stomach of the hog. Proved when assayed to be capable of digesting not less than 3,000 times its own weight of freshly coagulated and disintegrated egg albumin.

A fine, white, or cream-colored amorphous powder, or white, pale yellow or yellowish, transparent or translucent scales or grains, free from any offensive odor, and having a slightly acid or saline taste.

Sol.—Soluble, or almost entirely soluble, in about 50 parts of water, with more or less opalescence; more soluble in water acidulated with hydrochloric acid; insoluble in alcohol, ether, or chloroform.

Inc.—Rendered inert by **alkalies, tannic acid,** or by prolonged contact with **alcohol.**

Uses.—Digestant. **Dose, 0.25 Gm.**

Adm.—With hydrochloric acid in aromatic water (e. g. peppermint water) and glycerin.

PETROLATUM. (Pet-ro-la′-tum.) **Petrolati. Petrolatum.** An unctuous mass of yellowish color, odorless, tasteless.

Sol.—Insoluble in water; scarcely soluble in alcohol;

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readily soluble in ether, chloroform, carbon disulphide, petroleum benzin, benzene, fixed or volatile oils.

Uses.—Emollient.

PETROLATUM ALBUM. (Pet-ro-la′-tum al′-bum.) **Petrolati albi. White petrolatum.**

A white unctuous mass, odorless, and tasteless.

Sol. and uses.—Same as above.

PETROLATUM LIQUIDUM. (Pet-ro-la′-tum lik′-wid-um.) **Petrolati liquidi. Liquid petrolatum.**

A colorless, transparent, oily liquid, without odor or taste.

Uses.—Emollient; demulcent.

PHENOL. (Fe′-nol.) **Phe′nolis. Phenol.** Syn.—Carbolic acid. A constituent of coal tar.

Colorless, needle-shaped crystals, or a white, crystalline mass, sometimes acquiring a reddish tint; having a characteristic, somewhat aromatic odor, and, in dilute solution, a sweetish taste, with a slightly burning after-taste. Deliquescent on exposure to air.

Sol.—19.6 of water; freely in alcohol, ether, chloroform, benzene, carbon disulphide, glycerin, fixed and volatile oils; almost insoluble in petroleum benzin.

Inc.—1. Combines with concentrated solutions of **fixed alkali hydrates** to form carbolates. 2. With **ammonia water** green to blue color slowly developed. 3. Aqueous solution of phenol gives violet blue color with **ferric chloride.** 4. Coagulates solution of **albumin, gelatin,** or **collodion.** 5. It is a reducing agent; reducing salts of **silver, copper, mercury;** and it combines with, or is decomposed by **strong oxidizing agents.** 6. Liquefaction or softening occurs when phenol is triturated with **camphor, menthol, thymol, terpin hydrate, resorcinol, phenyl salicylate, naphthol, chloral, acetanilid, antipyrine,** etc. 7. When aqueous solutions of phenol and **antipyrine** are mixed an oily layer separates.

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Uses.—Caustic; disinfectant; antiseptic; local anesthetic; antipruritic; antiemetic. **Dose, 0,065 Gm.**

Prep.—1. **Phenol liquefactum** (86,4% phenol, with 13,6% of water.) **Dose, 0,05 Cc.**

2. **Glyceritum phenolis.** (Liquefied phenol 20%.) **Dose, 0,3 Cc.**

3. **Unguentum phenolis.** (Phenol, 3%.)

Adm.—In pills or capsules (with powdered glycyrrhiza or bread crumb); in powders (with bismuth subnitrate); or dissolved in aromatic water (e. g. peppermint water), with flavoring syrup (e. g., syrup of orange.)

PHENYLIS SALICYLAS. (Fe′-nil-is sal-is′-il-as.) **Phenylis salicyla′tis. Phe′nyl salic′ylate.** Syn.—Salol.

A white, crystalline powder, having a faintly aromatic odor, and a slight, but characteristic taste.

Sol.—2333 of water; 5 of alcohol; very soluble in ether, chloroform and fixed or volatile oils.

Inc.—1. Heating with **strong alkalies** decomposes it, forming a salicylate and phenol.

2. Alcoholic solution gives violet color with **ferric chloride.**

3. A liquid or a soft mass results when salol is triturated with **phenol, camphor, monobromated camphor, chloral hydrate, ethyl carbamate, sulphonethylmethane, naphthalin, thymol, resin,** etc.

Uses.—Intestinal antiseptic. **Dose, 0,50 Gm.**

Adm.—Powder in capsules or cachets, or (with sugar of milk) in powder papers. May also be prescribed in suspension by means of mucilage of acacia, e. g., in chalk mixture. Compressed tablets or hard pills should not be prescribed, as they may not be dissolved.

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Sol.—Nearly insoluble in water; soluble in 350 of absolute alcohol; 80 of absolute ether; 25 of chloroform; 50 of fixed oils; freely in carbon disulphide.

Inc.—It is a powerful reducing agent; and incompatible with all **oxidizing agents**; dry trituration with some of which is liable to result in explosions.

Uses.—Tonic and alterative. **Dose, 0,0005 Gm.**

Prep.—**Pilulae phosphori.** (0,0006 Gm. each.) **Dose, 1 pill.**

Adm.—In official pill; or in elixir, having previously been dissolved in absolute alcohol; or dissolved in expressed oil of almond, or in cod liver oil.

PHYSOSTIGMA. (Fi-sos-tig'-mah.) **Physostigmatis. Physostigma.** Syn.—Calabar bean. Ordeal bean. Large, oblong, somewhat kidney-shaped, chocolate-brown seed, with broad, black grove in convex side: odor, when crushed, bean-like and heavy; taste at first starchy, afterwards acrid.

Comp.—Two alkaloids: physostigmine (or eserine), and calabarine.

Inc.—See alkaloids.

Uses.—Motor depressant; myotic; stimulant to involuntary muscle. **Dose, 0,10 Gm.**

Prep.—1. **Extractum physostigmatis. Dose, 0,008 Gm.**
2. **Tinctura physostigmatis.** (10%.) **Dose, 1,00 Cc.**

Adm.—Extract or salt of alkaloid (physostigmine) in pills. The tincture with compound tincture of cardamom or other strongly alcoholic vehicle. Aqueous solution of physostigmine sulphate for hypodermic use; or use in the eye.

PHYSOSTIGMINAE SALICYLAS. (Fi-so-stig-mi'-ne sal-is'-il-as.) **Physostigminae salicyla'tis. Physostigmine salicylate.** Syn.—Eserine salicylate. The salicylate of an alkaloid obtained from physostigma.

Colorless or faintly yellowish, shining, acicular or short, columnar crystals, odorless, and having a slightly bitter taste. It acquires a reddish tint when long exposed to light and air.

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Sol.—In 72,5 parts of water, 12,7 of alcohol, 175 of ether, and 8,6 parts of chloroform.

Inc.—See alkaloids.

Uses.—Myotic, stimulant to involuntary muscle, motor-depressant. **Dose, 0,001 Gm.**

Adm.—See physostigma.

PHYSOSTIGMINAE SULPHAS. (Fi-so-stig-mi'-ne sul'-fas.) **Physostigminae sulpha'tis. Physostigmine sulphate.** Syn.—Eserine sulphate. The sulphate of an alkaloid obtained from physostigma.

A yellowish or yellowish-white, micro-crystalline powder; odorless and having a bitter taste. It is very deliquescent, and gradually turns reddish by exposure to light and air.

Sol.—Very soluble in water, alcohol, and chloroform; 1200 of ether.

Inc., Uses, and Adm.—See above. **Dose, 0,001 Gm.**

PHYTOLACCA. (Fi-to-lak'-ah.) **Phytolaccae. Phytolacca.** Syn.—Poke root. The dried root of *Phytolacca decandra.*

Large fleshy root, usually in transverse or longitudinal sections with projecting white wood bundles alternating with yellowish-gray parenchyma; odor slight; taste sweetish, afterwards highly acrid.

Comp.—Resin; a volatile acid; probably a glucoside.

Uses.—Emetic; **dose, 1 Gm.** Alterative; **dose, 0,125 Gm.**

Prep.—**Fluidextractum phytolaccae. Dose** (emetic), **1 Cc**; (alterative), **0,1 Cc.**

PILOCARPINAE HYDROCHLORIDUM. (Pi-lo-kar-pi'-ne hi-dro-klo'-rid-um.) **Pilocarpinae hydrochloridi. Pilocar'pine hydrochloride.** An alkaloid obtained from pilocarpus.

Colorless, or white, transparent crystals, odorless and having a faintly bitter taste; deliquescent on exposure to air.

Sol.—In 0,3 of water, 2,3 of alcohol, and 540 of chloroform; insoluble in ether.

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Inc.—General alkaloidal reagents (see alkaloids); not readily precipitated, however, by alkali hydrates or carbonates. With **calomel**, in the presence of moisture, darkening occurs.

Uses.—Diaphoretic. **Dose, 0,01 Gm.**

Adm.—In aqueous solution with flavoring syrup, e. g., syrup of orange. For prompt effect given hypodermically.

PILOCARPINAE NITRAS. (Pi-lo-kar-pi'-ne ni'-tras.) **Pilocarpinae nitra'tis. Pilocar'pine nitrate.** The nitrate of an alkaloid obtained from pilocarpus.

Colorless, or white, shining crystals, odorless, and having a faintly bitter taste, permanent in the air.

Sol.—In 4 of water, and 60 of alcohol; insoluble in ether and chloroform.

Inc.—See pilocarpinae hydrochloridum.

Uses.—Diaphoretic. **Dose, 0,01 Gm.**

Adm.—See pilocarpine hydrochloride.

PILOCARPUS. (Pi-lo-kar'-pus.) **Pilocarpi. Pilocarpus.** Syn.—Jaborandi. The leaflets of *Pilocarpus jaborandi* or of *Pilocarpus microphyllus.*

Compound leaf with five to eleven leaflets, each of which is rather large, oval or ovate oblong; yellow-green, very smooth, shining, thick and coriacious; peculiarly aromatic when crushed; taste bitterish, slightly salty, aromatic, later somewhat pungent and sialogogue.

Comp.—Alkaloids (not less than 0,5% on assay): pilocarpine, pilocarpidine, isopilocarpine; the first the most active. Recent investigation has thrown doubt on the existence of jaborine.

Inc.—See pilocarpinae hydrochloridum.

Uses.—Diaphoretic. **Dose, 2 Gm.**

Prep.—**Fluidextractum pilocarpi. Dose, 2 Cc.**

Adm.—Owing to uncertain alkaloidal strength, a salt of

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PIMENTA. (Pi-men'-tah.) **Pimentae. Pimenta.** Syn.—Allspice. The dried nearly ripe fruit of *Pimenta officinalis.*

Small, globular drupe, crowned with a short, four-parted calyx, externally dark-brown; two celled, each cell containing one reddish-brown seed; odor and taste peculiarly aromatic.

Comp.—A volatile oil (see below). Chemically almost identical with oil of cloves.

Inc. and Uses.—Same as those of cloves. **Dose, 1 Gm.**

Prepared by distillation from pimenta: **Oleum pimentae.** A volatile oil, 70% of which is eugenol. **Dose, 0,2 Cc.**

PIPER. (Pi'-per.) **Piperis. Pepper.** Syn.—Black pepper. The dried unripe fruit of *Piper nigrum.*

Small round, wrinkled, black berries; odor aromatic; taste pungently spicy.

Comp.—Volatile oil; resin, and piperine (see below).

Uses.—Counterirritant; stomachic; carminative. **Dose, 0,50 Gm.**

Prep.—**Oleoresina piperis. Dose, 0,03 Gm.**

PIPERINA. (Pi-per-i'-nah.) **Piperinae. Pi'perine.** A neutral principle obtained from pepper and other plants of the family Piperaceae.

Colorless or pale yellowish crystals, odorless and almost tasteless when first put in the mouth, but on prolonged contact producing a sharp and bitter sensation.

Sol.—Insoluble in water; 15 of alcohol; 36 of ether; 1,7 of chloroform.

Uses.—Antiperiodic (?). **Dose, 0,20 Gm.**

PIX LIQUIDA. (Piks lik'-wid-ah.) **Picis liquidae. Tar.** A product obtained by the destructive distillation of the wood of *Pinus palustris,* or of other species of Pinus.

Viscid, semi-fluid, blackish-brown; odor empyreumatic, terebinthinate; taste sharp, empyreumatic.

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Sol.—Slightly in water; soluble in alcohol, fixed and volatile oils, or solutions of potassium or sodium hydroxide.

Uses.—Local stimulant; antiseptic; expectorant. **Dose, 0,5 Gm.**

Prep.—1. **Syrupus picis liquidae.** (0,5%.) **Dose, 4 Cc.**
2. **Unguentum picis liquidae.** (50%.)

Prepared by distillation: **Oleum picis liquidae.** A volatile oil. **Dose, 0,2 Cc.**

Adm.—In pills (with powdered glycyrrhiza); capsules; or official syrup. Externally in form of 10 to 30% ointment; official ointment generally too strong.

PLUMBI ACETAS. (Plum′-bi as-e′-tas.) **Plumbi aceta′tis. Lead acetate.** Syn.—Sugar of lead.

Colorless, shining, transparent, monoclinic prisms or plates, or heavy white crystalline masses, or granular crystals, having a faintly acetous odor, and a sweetish astringent afterwards metallic taste. Efflorescent, and absorbing carbon dioxide, on exposure to the air.

Sol.—2 of water; 30 of alcohol.

Inc.—1. Precipitated by solutions of **fixed alkali hydrates, carbonates, phosphates, sulphides, cyanides, borax**; neutral **benzoates, citrates, tartrates, salicylates; sulphuric acid** and **sulphates; hydrochloric acid** and **chlorides, bromides, iodides; tannic acid; meconic acid** (of opium); and various **vegetable principles.**
2. Softening or liquefaction occurs on trituration with: **phenol, chloral hydrate, sodium phosphate,** or **salicylic acid.**

Uses.—Astringent. **Dose, 0,065 Gm.**

Prep.—1. **Emplastrum plumbi.**
2. **Unguentum diachylon.** (Lead plaster 50%.)
3. **Liquor plumbi subacetatis.** (25%.)
4. **Liquor plumbi subacetatis dilutus.** (1%.)
5. **Ceratum plumbi subacetatis.** (Sol. lead subacet. 20%.)

Adm.—In pill form.

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PLUMBI IODIDUM. (Plum'-bi i-od'-id-um.) **Plumbi iodidi. Lead i'odide.**

A heavy, bright-yellow powder, without odor or taste.

Sol.—In about 1300 of water; very slightly in alcohol.

Uses.—Sorbefacient.

PLUMBI NITRAS. (Plum'-bi ni'-tras.) **Plumbi nitra'tis. Lead nitrate.**

Colorless, transparent, octahedral crystals, or white, nearly opaque crystals; without odor, and having a sweetish, astringent, afterwards metallic taste.

Sol.—In 1,85 of water, almost insoluble in alcohol.

Inc.—See plumbi acetas.

Uses.—Caustic, applied as powder.

PLUMBI OXIDUM. (Plum'-bi oks'-id-um.) **Plumbi oxidi. Lead oxide.** Syn.—Litharge.

A heavy, yellowish or reddish-yellow powder, or minute scales, without odor or taste.

Sol.—Almost insoluble in water; insoluble in alcohol; but soluble in acetic acid or dilute nitric acid, and in warm solutions of the fixed alkali hydroxides.

Uses.—In preparing solution of lead subacetate.

PODOPHYLLUM. (Pod-o-fil'-um.) **Podophylli. Podophyllum.** Syn.—May Apple. Mandrake. The dried rhizome of *Podophyllum peltatum.*

Long rhizome with thickened nodes, with stem-scars above and root-scars below; externally glossy brown; internally whitish; odor slight; taste sweetish and disagreeably bitter and acrid.

Comp.—Resin (4 to 5%, see below); podophyllic acid, the coloring principle; etc.

Uses.—A drastic cholagogue cathartic. **Dose, 0,5 Gm.**

Prep.—1. **Resina podophylli.** An amorphous grayish-white to yellowish-green powder, of slight, peculiar odor, and a faintly bitter taste. Insoluble in water; soluble in alcohol; at least 75% soluble in ether; 65% soluble in chloroform. Consists mainly of podophyllotoxin, picropodophyllin (inert), and podophyllo-

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resin. **Dose** (purgative), **0,015 Gm.**; (laxative), **0,005 Gm.**

2. **Fluidextractum podophylli. Dose, 0,5 Cc.**
3. **Pilulae podophylli, belladonnae et capsici.** (Resin, 0,016 in each.) **Dose, 1 pill.**

Adm.—Best preparation, the resin, administered in pill form; with hyoscyamus or belladonna to correct tendency to gripe (as in official pill). Fluidextractum may be prescribed with compound tincture of cardamom.

POTASSII ACETAS. (Po-tas'-e-i as-e'-tas.) **Potassii aceta'tis. Potassium ac'etate.**

A white powder, or crystalline masses of a satiny lustre, odorless and having a warming, saline taste; very deliquescent.

Sol.—0,4 of water; 2 of alcohol.

Inc.—(a) Those of potassium. (See potassii hydroxidum.)

(b) Those of acetates. 1. See acidum aceticum.
2. Precipitates strong solutions of **quinine salts.**
3. Effervesces with **spirit of nitrous ether**; the acetate being converted into carbon monoxide and other gases.

Uses.—Alkaline diuretic. **Dose, 2 Gm.**

Adm.—In aromatic water, with flavoring syrup.

POTASSII BICARBONAS. (Po-tas'-e-i bi-kar'-bon-as.) **Potassii bicarbona'tis. Potassium bicarbonate.**

Colorless, transparent crystals, or a colorless, granular powder, odorless, having a saline and slightly alkaline taste.

Sol.—3 of water; almost insoluble in alcohol.

Inc.—(a) Those of potassium. (See potassii hydroxidum.)

(b) Those of carbonates. (See potassii carbonas.)

Uses.—Antacid. **Dose, 2 Gm.**

Adm.—In aromatic water, with flavoring syrup, e. g., syrup of orange.

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POTASSII BITARTRAS. (Po-tas'-e-i bi-tar'-tras.) **Potassii bitartra'tis. Potassium bitartrate.** Syn.—Cream of tartar.

Colorless crystals, or a white, somewhat gritty powder, odorless, and having a pleasant, acidulous taste.

Sol.—200 of water; more soluble in solutions of borax or boric acid; very sparingly in alcohol.

Inc.—1. It is acid in reaction, and has the incompatibilities of tartaric acid (q. v.).

2. It combines with hydrates and carbonates of the alkali metals to form soluble neutral salts.

Uses.—Diuretic, cathartic. **Dose** (diuretic), **2 Gm.**; (cathartic), **15 Gm.**

Adm.—As cathartic, prescribed as powder (often with sulphur), and administered mixed with molasses or suspended in water. As diuretic dissolved in aromatic liquid, e. g., infusion of juniper.

POTASSII BROMIDUM. (Po-tas'-e-i bro'-mid-um.) **Potassii bromidi. Potassium bromide.**

Colorless or white, cubical crystals, or a granular powder; odorless, and having a strongly saline taste.

Sol.—1,5 of water; 180 of alcohol; 4 of glycerin.

Inc.—(a) Those of potassium. (See potassii hydroxidum.) (b) Those of bromides. (See acidum hydrobromicum.)

Uses.—Sedative nervine. **Dose, 1 Gm.**

Adm.—In aqueous solution flavored with aromatic syrup, e. g., syrup of orange, or syrup of wild cherry; or dissolved in aromatic elixir. It should be taken, well diluted, after meals.

POTASSII CARBONAS. (Po-tas'-e-i kar'-bon-as.) **Potassii carbona'tis. Potassium carbonate.** Syn.—Salt of tartar.

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1. Carbonates are decomposed by **acids,** excepting hydrosulphuric and hydrocyanic acids.
2. Potassium and sodium carbonates precipitate solutions of **salts of nearly all other common metals.**
3. The free alkaloid is precipitated from aqueous solutions of **most alkaloidal salts.**

Uses.—Feeble caustic; solvent. **Dose, 1 Gm.**

POTASSII CHLORAS. (Po-tas'-e-i klo'-ras.) **Potassii chlora'tis. Potassium chlorate.**

Colorless, lustrous, monoclinic prisms or plates, or a white granular powder, odorless and having a cooling, characteristic taste.

Sol.—16 of water; insoluble in absolute alcohol.

Inc.—(a) Those of potassium. (See potassii hydroxidum.) (b) Chlorates are powerful oxidizing agents; incompatible with **reducing agents;** with many of which explosion is liable to result on dry trituration or heating.

Uses.—Antiseptic; stimulant to mucous membrane. **Dose, 0,25 Gm.**

Prep.—**Trochisci potassii chloratis.** (0,15 Gm. in each.)

Adm.—In aqueous solution sweetened with syrup, or glycerin.

POTASSII CITRAS. (Po-tas'-e-i si'-tras.) **Potassii citra'tis. Potassium citrate.**

Transparent crystals, or a white, granular powder, odorless and having a cooling, saline taste; deliquescent.

Sol.—0,5 of water; sparingly in alcohol.

Inc.—Soluble citrates precipitate solutions of **lead acetate** and **silver nitrate;** precipitate being soluble in excess. **Lime water,** and strong **quinine** solutions may likewise be precipitated.

Uses.—Alkaline diuretic. **Dose, 1 Gm.**

Prep.—1. **Potassii citras effervescens.** (20%.) **Dose, 4 Gm.**

2. **Liquor potassii citratis.** (8%.) **Dose, 16 Cc.**

Adm.—Aqueous solution with syrup of citric acid, or the effervescing salt taken in lemonade.

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POTASSII CYANIDUM. (Po-tas'-e-i si-an'-id-um.) **Potassii cyanidi. Potassium cyanide.**

White, opaque, amorphous pieces, or a white, granular powder, odorless when perfectly dry; deliquescent in the air, and exhaling the odor of hydrocyanic acid.

Sol.—2 of water; sparingly in alcohol.

Inc.—This salt is strongly alkaline, usually containing carbonate. (See potassii carbonas and acidum hydrocyanicum.)

Uses.—Antipruritic. **Dose, 0,01 Gm.**

POTASSII DICHROMAS. (Po-tas'-e-i di-kro'-mas.) **Potassii dichroma'tis. Potassium dichromate.** Syn.—Potassium bichromate.

Large, orange-red, transparent, triclinic prisms or four-sided tabular crystals, odorless, and having an acidulous, metallic taste.

Inc.—It is a powerful oxidizing agent; and **almost universally incompatible.**

Sol.—In about 9 of water; insoluble in alcohol.

Uses.—Caustic and antiseptic. **Dose, 0,01 Gm.**

Adm.—In pills or capsules, with kaolin as diluent, and petrolatum as excipient.

POTASSII ET SODII TARTRAS. (Po-tas'-e-i et so'-de-i tar'-tras.) **Potassii et sodii tartra'tes. Potassium and sodium tartrate.** Syn.—Rochelle salt.

Colorless, transparent crystals, or a white powder, odorless and having a cooling, saline taste. Slightly efflorescent.

Sol.—In about 1,2 of water, almost insoluble in alcohol.

Inc.—**Nearly all acids,** when added to strong solutions of this salt, cause precipitation of potassium bitartrate.

Uses.—Hydragogue purgative. **Dose, 8 Gm.**

Prep.—**Pulvis effervescens compositus. Dose 1 set of 2 powders.**

Adm.—Most commonly in form of official preparation, the compound effervescing powder, popularly known as Seidlitz powder.

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POTASSII FERROCYANIDUM. (Po-tas'-e-i fer-o-si-an'-id-um.) **Potassii ferrocyanidi. Potassium ferrocyanide.**

Large, soft, transparent, yellow, four-sided, monoclinic tabular crystals, odorless, having a mild saline taste.

Sol.—In 4 of water; insoluble in alcohol.

Uses.—Mainly in preparation of cyanides. **Dose, 0,50 Gm.**

POTASSII HYDROXIDUM. (Po-tas'-e-i hi-droks'-id-um.) **Potassii hydroxidi. Potassium hydroxide.** Syn.—Caustic potash.

Dry, white masses, odorless, or having a faint odor of lye and of a very acrid and caustic taste. Deliquescent.

Sol.—0,4 of water; 2 of alcohol.

Inc.—(a) Those of potassium. Rather concentrated solutions give precipitate of potassium bitartrate with **sodium bitartrate** or an excess of **tartaric acid.**

(b) Those of fixed alkali hydrate.

1. It combines with **acids** to form salts.
2. Liberates **ammonium** and **alkaloids** from their salts.
3. Precipitates solutions of **nearly all other common metals.**
4. **Chloral hydrate, phenyl salicylate, methyl salicylate,** many of the **glucosides,** and some **alkaloids** are decomposed.
5. With **fats, fixed oils,** and **resins,** it forms soaps.

Uses.—Caustic, solvent.

Prep.—**Liquor potassii hydroxidi.** (5%.) **Dose, 1 Cc.**

Adm.—The official solution with aromatic water (e. g., cinnamon water), and flavoring syrup (e. g., syrup of orange), administered freely diluted.

POTASSII HYPOPHOSPHIS. (Po-tas'-e-i hi-po-fos'-fis.) **Potassii hypophosphi'tis. Potassium hypophosphite.**

White, opaque plates, or a granular powder, having a

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Prep.—**Syrupus hypophosphitum.** (1,5%.) **Dose, 8 Cc. Syrupus hypophosphitum compositus.** (1,75%.) **Dose, 8 Cc.**

Adm.—In syrupy solution.

POTASSII IODIDUM. (Po-tas'-e-i i-od'-id-um.) **Potassii iodidi. Potassium i'odide.**

Colorless, or white, cubical crystals, or a white granular powder, having a peculiar, faint, iodine-like odor, and a pungent, saline, afterwards bitter taste.

Sol.—0,7 of water; 12 of alcohol; 2,5 of glycerin.

Inc.—See acidum hydriodicum.

Uses.—Alterative. **Dose, 0,50 Gm.**

Prep.—**Unguentum potassii iodidi.** (10%.)

Adm.—In aqueous solution, sweetened with flavoring syrup (e. g., syrup of orange, or syrup of tolu), taken, well diluted, in water or in milk after meals.

POTASSII NITRAS. (Po-tas'-e-i ni'-tras.) **Potassii nitra'tis. Potassium nitrate.** Syn.—Nitre. Saltpetre.

Colorless, transparent crystals, or a white crystalline powder, odorless, and having a cooling saline and pungent taste.

Sol.—3,6 of water; very sparingly in alcohol.

Inc.—See acidum nitricum.

Uses.—Diuretic. **Dose, 0,50 Gm.**

Adm.—Aqueous solution with syrup of citric acid.

POTASSII PERMANGANAS. (Po-tas'-e-i per-man'-gan-as.) **Potassii permangana'tis. Potassium permanganate.**

Slender, monoclinic prisms of a dark purple color, almost opaque by transmitted, and of a blue, metallic lustre by reflected light, odorless, and having a taste at first sweet, but afterwards disagreeable and astringent.

Sol.—In about 15 of water; in contact with alcohol or glycerin it is decomposed.

Inc.—A powerful oxidizing agent, extensively incompatible with **reducing agents**; with some of which, on dry trituration, explosion is liable to result.

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Uses.—Antiseptic; deodorant; emmenagogue. **Dose, 0,065 Gm.**

Adm.—In pill (with koalin and petrolatum).

POTASSII SULPHAS. (Po-tas′-e-i sul′-fas.) **Potassii sulpha′-tis. Potassium sulphate.**

Hard, colorless, transparent crystals, or a white powder, odorless, having a somewhat bitter, saline taste.

Sol.—9 of water; insoluble in alcohol.

Inc.—See acidum sulphuricum.

Uses.—Cathartic. **Dose, 2 Gm.**

Adm.—In aqueous solution, sweetened with syrup of orange; or in lemonade.

PRUNUM. (Pru′-num.) **Pruni. Prune.** The partly dried fruit of *Prunus domestica.*

Oblong, more or less compressed and shrivelled brownish-black drupe of fruit-like odor, and sweet taste.

Comp.—Sugar; malic acid; etc.

Uses.—Laxative; corrective for senna, e. g., in confection of senna.

PRUNUS VIRGINIANA. (Pru′-nus vir-jin-e-a′-na.) **Pruni virginianae. Wild cherry.** The bark of *Prunus serotina.*

Usually in transversely curved pieces, externally greenish-ish-brown, internally light-brown; odor bitter almond-like when macerated with water; taste astringent, aromatic, and agreeably bitter.

Comp.—Tannic acid; the glucoside, amygdalin; and the ferment, emulsion. The last two ingredients react in the presence of water; the amygdalin yielding hydrocyanic acid, oil of bitter almond, and glucose.

Uses.—Aromatic bitter tonic; feeble nerve-sedative; flavoring agent. **Dose, 2 Gm.**

Prep.—1. **Fluidextractum pruni virginianae. Dose, 2 Cc.**

2. **Syrupus pruni virginianae.** (15%.) **Dose, 4 Cc.**

3. **Infusum pruni virginianae.** (4%.) **Dose, 60 Cc.**

PULVERES. See p. 138.

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PYRETHRUM. (Pi-re'-thrum.) **Pyrethri. Pyrethrum.** Syn. —Pellitory. The root of *Anacyclus pyrethrum.*

Fleshy, simple, fusiform root, deeply wrinkled and dark-brown externally, light yellow within; odor distinct; taste pungent, very acrid, producing a prompt sialogogue effect.

Comp.—Two volatile oils; acrid resin; inulin (50%).

Uses.—Rubefacient, sialogogue. **Dose, 2 Gm.**

Prep.—**Tinctura pyrethri.** (20%.)

PYROGALLOL. (Pi-ro-gal'-ol.) **Pyrogallolis. Pyrogallol.** Syn.—Pyrogallic acid.

Light, white laminae, or fine needles; odorless; having a bitter taste; acquiring a gray or darker tint on exposure to air and light.

Sol.—1,6 of water; 1 of alcohol; 1,1 of ether.

Inc.—A powerful reducing agent, very **generally incompatible.**

Uses.—Irritant, antiseptic.

Adm.—In 5 to 10% solution, ointment, or collodion.

PYROXYLINUM. (Pi-roks-il-i'-num.) **Pyroxylini. Pyrox'-ylin.** Syn.—Soluble gun cotton.

A yellowish-white matted mass of filaments, resembling raw cotton in appearance, harsh to the touch; exceedingly inflammable.

Sol.—Slowly but completely soluble in 25 parts of a mixture of 3 volumes of ether and 1 volume of alcohol; soluble in acetone and in glacial acetic acid.

Prep.—Collodia. See p. 177.

QUASSIA. (Kwosh'-e-ah.) **Quassiae. Quassia.** The wood of *Picrasma exelsa,* or of *Quassia amara.*

A white wood, usually occurring in the drug trade in coarse shavings or raspings, odorless and intensely bitter.

Comp.—Quassiin, a bitter principle. No tannic acid present.

Uses.—Bitter stomachic. **Dose, 0,50 Gm.**

Prep.—1. **Extractum quassiae. Dose, 0,065 Gm.**

2. **Fluidextractum quassiae. Dose, 0,50 Cc.**

3. **Tinctura quassiae.** (20%.) **Dose, 2,00 Cc.**

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QUERCUS. (Kwer'-kus.) **Quercus. Quercus.** Syn.—White oak. The dried bark of *Quercus alba.*

In nearly flat pieces, externally light brown; odor distinct; taste strongly astringent.

Comp.—Quercitannic acid (6 to 11%), a variety of tannic acid; quercin, a bitter principle, etc.

Inc.—See acidum tannicum.

Uses.—Astringent. **Dose, 1 Gm.**

Prep.—**Fluidextractum quercus. Dose, 1 Cc.**

QUILLAJA. (Kwil-a'-yah.) **Quillajae. Quillaja.** Syn.—Panama bark. Soap bark. The dried bark of *Quillaja saponaria,* deprived of the periderm.

Large, flat pieces, reddish-brown externally, yellowish-white internally; odor slight; taste acrid. The powder is strongly sternutatory.

Comp.—Saponin, a glucoside, about 9%.

Uses.—Emulsifyer, stimulant expectorant.

Prep.—1. **Fluidextractum quillajae. Dose, 0,2 Cc.**

2. **Tinctura quillajae.** (20%.)

QUININA. (Kwin-i'-nah.) **Quininae. Qui'nine.**

An alkaloid obtained from the bark of various species of Cinchona.

A white, flaky or micro-crystalline powder, odorless, and having a very bitter taste; slightly efflorescent in dry air.

Sol.—1750 of water; 0,6 of alcohol; 4,5 of ether; 1,9 of chloroform; 158 of glycerin; 120 of benzene. It is soluble in diluted acids, owing to formation of soluble salts.

Inc.—1. The **general alkaloidal reagents,** excepting bromides and iodides (which only give precipitate in very concentrated solution).

2. Alkali **acetates, citrates, benzoates, salicylates, tartrates** form bulky precipitates.

Uses.—Antimalarial; bitter tonic; antipyretic; ecbolic. **Dose, 0,25 Gm.**

Prep.—**Oleatum quininae.** (25%.)

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Adm.—In form of its salts which are more soluble, especially the bisulphate or hydrochloride. Best prescribed as powder in capsules or in cachets; or in freshly made pills. For children in form of suppository (absorption, however, very imperfect); or the sulphate suspended, in aromatic syrup of eriodictyon, or in fluidextract of glycyrrhiza or in adjuvant elixir.

QUININAE BISULPHAS. (Kwin-i′-ne bi-sul′-fas.) **Quininae bisulpha′tis. Quinine bisulphate.**

Colorless, transparent or whitish, orthorhombic crystals, or small needles, odorless, and having a very bitter taste. It effloresces on exposure to the air, and turns yellow on exposure to light.

Sol.—In 8.5 of water, in 18 of alcohol, and in 18 of glycerin, 1770 of ether, 920 of chloroform.

Inc.—See quinina.

Uses.—See quinina. **Dose, 0,25 Gm.**

Adm.—See quinina. May be used hypodermically in aqueous solution, slightly acidulated with tartaric acid.

QUININAE HYDROBROMIDUM. (Kwin-i′-ne hi-dro-bro′-mid-um.) **Quininae hydrobromidi. Quinine hydrobromide.**

White, light, silky needles, odorless and having a very bitter taste. Effloresces on exposure to the air.

Sol.—In 40 of water; in 0,67 of alcohol; in 16 of ether; in 8 of glycerin. Very soluble in chloroform.

Inc.—See quinina.

Uses and adm.—See quinina. **Dose, 0,25 Gm.**

QUININAE HYDROCHLORIDUM. (Kwin-i′-ne hi-dro-klo′-rid-um.) **Quininae hydrochloridi. Quinine hydrochloride.**

White, silky, light and fine, needle-shaped crystals, odorless, and having a very bitter taste; efflorescent.

Sol.—In 18 of water; 0.6 of alcohol; 0.8 of chloroform; 8 of glycerin; 240 of ether.

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Inc.—See quinina.

Uses and adm.—See quinina. **Dose, 0,25 Gm.**

QUININAE SALICYLAS. (Kwin-i′-ne sal-is′-il-as.) **Quininae salicyla′tis. Quinine salicylate.**

Colorless needles, permanent in the air, but on keeping readily assuming a pinkish color.

Sol.—In 77 of water; 11 of alcohol; 110 of ether; 37 of chloroform; 16 of glycerin.

Inc.—See quinina and acidum salicylicum.

Uses and adm.—See quinina. **Dose, 0,25 Gm.**

QUININAE SULPHAS. (Kwin-i′-ne sul′-fas.) **Quininae sulpha′tis. Quinine sulphate.**

White, silky, light, flexible, glistening crystals, or very hard prismatic, monoclinic needles, making a very light and easily compressible mass, odorless, and having a persistent, very bitter taste. It effloresces rapidly when it is exposed to dry air; when exposed to light it acquires a brownish tint.

Sol.—In 720 of water; 86 of alcohol; 400 of chloroform; 36 of glycerin; very difficulty soluble in ether. Diluted acids increase its solubility in water; and it is easily soluble in a mixture of chloroform 2 parts, and absolute alcohol 1 part.

Inc.—See quinina.

Uses and adm.—See quinina. **Dose, 0,25 Gm.**

RESINA. (Rez-i′-nah.) **Resinae. Ro′sin.** Syn.—Resin. Colophony.

The residue left after distilling off the volatile oil from turpentine.

Usually in sharp, angular fragments, translucent, amber-colored, usually covered with a yellowish dust; at ordinary temperatures brittle, puverizable; fracture shiny and shallow conchoidal; odor and taste faintly terebinthinate.

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Inc.—1. Liquefaction or softening occur on trituration with **phenol, menthol, phenyl salicylate, ethyl carbamate.**

2. Decomposed by **oxidizing agents.**

Uses.—Antiseptic; mildly irritant; adhesive.

Prep.—1. **Ceratum resinae.** (35%.)

2. **Ceratum resinae compositum.** (22,5%.)

RESINAE. See p. 136.

RESORCINOL. (Re-zor'-sin-ol.) **Resorcino'lis. Resorcinol.** Syn.—Resorcin. Metadioxybenzol.

Colorless, needle-shaped crystals, having a faint, peculiar odor, and a sweetish and afterwards bitter taste. It acquires a pinkish tint on exposure to light and air.

Sol.—In 0.5 of water; slightly more soluble in alcohol; also readily soluble in ether or glycerin; very slightly soluble in chloroform, carbon disulphide, and benzene.

Inc.—1. Color reactions: with **ferric chloride** (violet); with **chlorinated lime or soda** (violet to yellow); **spirit of nitrous ether** (dark red).

2. Liquefaction or softening occurs on trituration with **phenol, menthol, camphor, chloral hydrate, acetanilide, antipyrine,** etc.

Uses.—Antiseptic, antipruritic. **Dose, 0,125 Gm.**

Adm.—Externally in 3 to 5% lotion. Internally in pill or capsule; or solution in aromatic water (e. g., peppermint water), sweetened with glycerin or flavoring syrup (e. g., syrup of orange).

RHAMNUS PURSHIANA. (Ram'-nus pur-she-a'-na.) **Rhamni purshianae. Cascara sagrada.** Syn.—Sacred bark. Chittem bark. The dried bark of *Rhamnus purshiana.*

Quills or curved pieces, externally reddish-brown, internally light brownish; odor distinct; taste bitter and slightly acrid.

Comp.—A crystalline glucoside, purshianin; resins; acid; volatile oil.

Uses.—Tonic laxative; stomachic. **Dose, 1 Gm.**

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Prep.—1. **Extractum rhamni purshianae. Dose, 0,25 Gm.**
2. **Fluidextractum rhamni purshianae. Dose, 1 Cc.**
3. **Fluidextractum rhamni purshianae aromaticum. Dose, 1 Cc.**

Adm.—The aromatic fluidextract represents an attempt to render this extremely bitter drug less disagreeable to the taste. This preparation might be prescribed with the addition of glycerin for sweetening. However, the simple fluidextract is probably the best and most active preparation of the drug; it may, just before taking, be filled by the patient in gelatin capsules, and thus taken without discomfort.

RHEUM. (Re'-um.) **Rhei. Rhubarb.** The dried rhizome of *Rheum officinale, Rheum palmatum,* and probably other species of Rheum.

Large orange-yellow pieces of root of characteristic odor and bitter astringent taste; gritty when chewed.

Comp.—Chrysophanic acid; emodin (probably the chief purgative principle); tannic acid; several principles resembling resins; calcium oxalate (35%) to which the grittiness is due.

Inc.—See acidum tannicum.

Uses.—Purgative; astringent; stomachic. **Dose, 1 Gm.**

Prep.—1. **Extractum rhei. Dose, 0,25 Gm.**
2. **Fluidextractum rhei. Dose, 1 Cc.**
3. **Tinctura rhei.** (20%.) **Dose, 4 Cc.**
4. **Syrupus rhei.** (Fluidext. 10%; contains potassium carbonate, 1%.) **Dose, 8 Cc.**
5. **Tinctura rhei aromatica.** (20%.) **Dose, 2 Cc.**
6. **Syrupus rhei aromaticus.** (Arom. tinct. 15%; potassium carbonate, 0,1%.) **Dose, 8 Cc.**
7. **Mistura rhei et sodae.** (Fluidext. 1,5%.) **Dose, 4 Cc.**
8. **Pulvis rhei compositus.** (25%.) **Dose, 2 Gm.**
9. **Pilulae rhei compositae** (0,13 Gm. in each). **Dose, 2 pills**

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desirable. The aromatic preparations, on the other hand, are quite pleasant, most especially the aromatic syrup. The compound rhubarb powder is best prescribed in cachets.

RHUS GLABRA. (Rus gla′-brah.) **Rho′is glabrae. Rhus Glabra.** Syn.—Sumach. The dried fruit of *Rhus Glabra.*

Small oval drupe, externally deep crimson, densely hairy; inodorous; taste acidulous, astringent.

Comp.—Tannin; mallates, etc.

Uses.—Astringent, refrigerant. **Dose, 1 Gm.**

Prep.—**Fluidextractum rhois glabrae. Dose, 1 Cc.**

Adm.—The fluidextract may be prescribed with aromatic elixir.

ROSA GALLICA. (Ro′-zah gal′-ik-ah.) **Rosae gallicae. Red rose.** The dried petals of *Rosa gallica.*

Small purplish-red cones, consisting of imbricated roundish petals; odor characteristic; taste, bitterish, slightly acidulous, and distinctly astringent.

Comp.—Volatile oil; tannin, etc.

Uses.—Flavoring agent.

Prep.—1. **Syrupus rosae.** (12.5%.)
2. **Mel rosae.** (12%.) **Dose, 4 Cc.**
3. **Fluidextractum rosae. Dose, 2 Cc.**
4. **Confectio rosae.** (8%.)

Prepared by distillation from the fresh flowers: **Oleum rosae.** Oil of rose. Syn.—Attar of rose. A volatile oil. For sol. and inc., see olea volatilia.

Prep.—1. **Aqua rosae fortior. Dose, 8 Cc.**
2. **Aqua rosae. Dose, 16 Cc.**
3. **Unguentum aquae rosae.** (Syn.—Cold cream.)

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Comp.—Tannic acid (10 to 13%); villosin, a bitter glucoside; etc.
Inc.—See acidum tannicum.
Uses.—Astringent, tonic. **Dose, 1 Gm.**
Prep.—1. **Fluidextractum rubi. Dose, 1 Cc.**
2. **Syrupus rubi.** (Fluidextract, 25%.) **Dose, 4 Cc.**

SABAL. (Sa'-bal.) **Sabal. Sabal.** Syn.—Saw palmetto. The partially dried ripe fruit of *Serenoa serrulata.*
Irregularly spheroidal or ovoid blackish-brown, somewhat oily fruit; odor aromatic; taste sweetish, acrid and oily.
Comp.—A volatile oil; a fixed oil; an alkaloid; a resin, etc.
Uses.—Diuretic; expectorant; sedative. **Dose, 1 Gm.**

SABINA. (Sa-bi'-nah.) **Sabinae. Savin.** The tops of *Juniperus Sabina.*
Short, thin branchlets with dark green scaly leaves, closely appressed to the twigs. The scales present a longitudinal groove. Odor peculiar, terebinthinate; taste nauseous, resinous, and bitter.
Comp.—Volatile oil, 2%.
Uses.—Counter-irritant; emmenagogue. **Dose, 0,5 Gm.**
Prep.—**Fluidextractum sabinae. Dose, 0,3 Cc.**
Prepared by distillation from the fresh tops:
Oleum sabinae, a volatile oil. **Dose, 0,05 Cc.**

SACCHARUM. (Sak-ar'-um.) **Sacchari. Sugar.** Syn.—Cane sugar. White, dry, hard, distinctly crystalline granules, odorless, and having a purely sweet taste.
Sol.—0,46 of water; 137,2 of alcohol; insoluble in ether, chloroform, or carbon disulphide.
Inc.—Sugar is a reducing agent, and incompatible with **oxidizing agents.** Triturating it with strong oxidizing agents is liable to cause an explosion.
Uses.—Sweetening and preservative agent; and nutritive.
Prep.—**Syrupus.** (85%.)

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SACCHARUM LACTIS. (Sak-ar'-um lak'-tis.) **Sacchari lactis. Sugar of milk.** Syn.—Lactose.

White, hard, crystalline masses, or a white powder feeling gritty on the tongue, odorless and having a faintly sweet taste.

Sol.—4,79 of water; insoluble in absolute alcohol, ether, or chloroform.

Inc.—See saccharum.

Uses.—Diluent in pharmacy; nutritive, diuretic.

SAFROLUM. (Saf-ro'-lum.) **Safroli. Saf'rol.**

A colorless or faintly yellow liquid with a sassafras-like odor.

Sol.—In about an equal volume of strong alcohol. Mixible in all proportions with ether and chloroform.

Uses.—Same as oil of sassafras. **Dose, 0,3 Cc.**

SALICINUM. (Sal-is-i'-num.) **Salicini. Sal'icin.**

A glucoside obtained from several species of Salix and Populus.

Colorless, silky, shining crystalline needles, or a white crystalline powder, odorless, and having a very bitter taste.

Sol.—21 of water; 71 of alcohol; insoluble in ether or chloroform.

Inc.—**Dilute acids** or **water and heat,** change it to saligenin and glucose.

Uses.—Stomachic, antirheumatic. **Dose, 1 Gm.**

Adm.—In capsule, cachet, or pill; or in aqueous solution with syrup of orange.

SALVIA. (Sal'-ve-ah.) **Salviae. Salvia.** Syn.—Sage. The dried leaves of *Salvia officinalis.*

Ovate-oblong, grayish-green, downy leaves of aromatic odor; taste aromatic, bitter, and somewhat astringent.

Comp.—Volatile oil; resin; tannic acid, etc.

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Short and compact, dark reddish-brown rhizome; odor slight; taste bitter and acrid.

Comp.—The alkaloid sanguinarine; several other unimportant alkaloids; resin, etc.

Uses.—Stimulant expectorant. **Dose, 0,125 Gm.**

Prep.—1. **Fluidextractum sanguinariae. Dose, 0,1 Cc.**
2. **Tinctura sanguinariae.** (10%.) **Dose, 1 Cc.**

Note.—Both these preparations contain acetic acid; hence have the incompatibles of the latter.

SANTALUM RUBRUM. (San'-tal-um rub'-rum.) **Santali rubri. Red sounders.** The heart-wood of *Pterocarpus santalinus.*

Reddish-brown chips or powder, nearly inodorous and nearly tasteless.

Sol.—It imparts a red color to alcohol, but not to water.

Comp.—Santalin is the coloring principle.

Uses.—Coloring agent.

SANTONICA. (San-ton'-ik-ah.) **Santonicae. Santonica.** Syn. —Levant wormseed. The dried unexpanded flower-heads of *Artemisia pauciflora.*

Yellowish-green or greenish-brown granules, looking like small seeds, but consisting of small unopened flower-heads; odor strong, peculiar, somewhat camphoraceous; taste aromatic and bitter.

Comp.—Santonin (see santoninum); a volatile oil (2%).

Inc.—See santoninum.

Uses.—Anthelmintic against round worm; used mainly in form of its active principle. See santoninum.

SANTONINUM. (San-to-ni'-num.) **Santonini. San'tonin.** The anhydride of santonic acid obtained from santonica.

Colorless, shining, flattened, rhombic prisms; odorless and nearly tasteless when first put in the mouth, but afterwards developing a bitter taste; not altered by exposure to air, but turning yellow on exposure to light.

Sol.—5300 of water; 34 of alcohol; 78 of ether; 2.5 of chloroform. With solution of alkali hydrates it forms water-soluble santoninates.

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Inc.—Precipitated by **lead acetate, lead subacetate, tannic acid, ferrous sulphate, copper sulphate.**

Uses.—Anthelmintic against round worms. **Dose, 0,065 Gm.**

Prep.—**Trochisci santonini.** (0,03 Gm.)

Adm.—The official lozenge; or in powder mixed with sugar; or in powder mixed with compound powder of glycyrrhiza.

SAPO. (Sa'-po.) **Sapo'nis. Soap.** Syn.—White castile soap. Hard soap.

A white or whitish solid, hard, yet easily cut when fresh, having a faint, peculiar odor free from rancidity, a disagreeable, alkaline taste, and an alkaline reaction.

Sol.—In water and in alcohol, more readily with the aid of heat.

Inc.—1. Aqueous solution decomposed by **mineral acids,** which liberate the fatty acids.

2. Aqueous solutions form precipitates with salts of **nearly all metals.**

3. Blackens **calomel,** owing to alkalinity.

Uses.—Detergent; antacid; local stimulant.

Prep.—1. **Emplastrum saponis.** (10%.)

2. **Linimentum saponis.** (6%.)

SAPO MOLLIS. (Sa'-po mol'-is.) **Sapo'nis mollis. Soft soap.** Syn.—Sapo viridis. Green soap.

A soft, unctuous, yellowish-brown mass, having a characteristic odor and an alkaline taste.

Sol.—In hot water to a nearly clear liquid; **also in hot** alcohol without leaving more than 3 **per cent of** insoluble residue.

Inc.—See sapo.

Uses.—Detergent; antacid; local stimulant.

Prep.—**Linimentum saponis mollis.** (65%.)

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Comp.—Parillin, an acrid glucoside, soluble in water and alcohol, insoluble in ether, closely resembling saponin.

Inc.—Alkalies.

Uses.—Alterative (?). **Dose, 2 Gm.**

Prep.—1. **Fluidextractum sarsaparillae. Dose, 2 Cc.**

2. **Fluidextractum sarsaparillae compositum. Dose, 2 Cc.**

3. **Syrupus sarsaparillae compositus.** (Fluidextract, 20%.) **Dose, 16 Cc.**

SASSAFRAS. (Sas'-a-fras.) **Sassafras. Sassafras.** The dried bark of the root of *Sassafras variifolium.*

Curved reddish-brown fragments; strongly fragrant; taste sweetish, aromatic, and somewhat astringent.

Comp.—Volatile oil (5%; see below); resin; tannic acid; sassafrid, a decomposition product of tannic acid.

Use.—Mainly as flavoring agent. **Dose, 8 Gm.**

Prepared from sassafras by distillation: **Oleum sassafras,** a volatile oil. **Dose, 0,2 Cc.**

SASSAFRAS MEDULLA. (Sas'-a-fras me-dul'-ah.) **Sassafras medullae. Sassafras pith.** The dried pith of sassafras.

Cylindrical pieces, often curved or coiled, whitish, very light, with a slight odor and a mucilaginous taste.

Comp.—Mucilage, soluble in water, not precipitated by alcohol.

Uses.—Demulcent.

Prep.—**Mucilago sassafras medullae.** (2%.) **Dose, 16 Cc.**

SCAMMONIUM. (Skam-o'-ne-um.) **Scammonii. Scam'mony.** A gum resin obtained by incising the living root of *Convolvulus scammonia.*

In irregular, angular pieces or circular cakes, greenish-gray or brownish-black, often covered with a grayish-white powder; very brittle, breaking with an angular fracture, porous and of a resinous lustre: internally of a uniform brownish-black color, more or less translucent in thin fragments; odor peculiar, somewhat cheese-like; taste slightly acrid.

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Comp.—Resin (75 to 80%); gum (10 to 20%); **starch.**
Uses.—Drastic cathartic. **Dose, 0,25 Gm.**
Prep.—**Resina scammonii. Dose, 0,20 Gm.**
Adm.—In pill form.

SCILLA. (Sil′-ah.) **Scillae. Squill.** Syn.—Sea onion.
The bulb of *Urginea maritima,* deprived of its dry, membranaceous outer scales, and cut into thin slices.
In irregular curved segments, slightly translucent, yellowish-white or reddish; odor slight; taste mucilaginous, bitter and acrid.
Comp.—Scillitoxin; scillipicrin; scillin, etc.
Uses.—Expectorant; diuretic. **Dose, 0,125 Gm.**
Prep.—1. **Fluidextractum scillae. Dose, 0,1 Cc.**
2. **Tinctura scillae.** (10 %.) **Dose, 1 Cc.**
3. **Acetum scillae.** (10 %.) **Dose, 1 Cc.**
4. **Syrupus scillae.** (Vinegar of squill, 45%.) **Dose, 2 Cc.**
5. **Syrupus scillae compositus.** (Fluidextract, 8%.) **Dose, 2 Cc.**
Note.—The fluidextract and both syrups contain acetic acid; hence they have the incompatibilities of acids (see acida), and are incompatible, for instance, with ammonium carbonate.

SCOPARIUS. (Sko-pa′-re-us.) **Scoparii. Scoparius.** Syn.—**Broom.** The dried tops of *Cytisus scoparius.*
Stems thin, flexible, pentangular, nearly smooth, tough, dark-green, usually free from the simple, subovate leaves; odor peculiar when bruised; taste disagreeably bitter.
Comp.—Scoparin, a tasteless neutral principle; sparteine, liquid alkaloid, which forms crystalline salts (see sparteinae sulphas); and tannic acid.
Uses.—Diuretic. **Dose, 1 Gm.**
Adm.—Generally in form of decoction, which may be sweetened.

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Curved and flexuous, rather large rhizome, marked with closely set, large, cup-shaped stem scars, externally yellowish-brown to dark brownish-gray; nearly inodorous; taste sweetish, afterwards bitterish and strongly acrid.

Comp.—Several alkaloids (not less than 0,5 %), chief of which are scopolamine (see below) and hyoscyamine.

Uses.—Like those of hyoscyamus. **Dose, 0,045 Gm.**

Prep.—1. **Extractum scopolae. Dose, 0,01 Gm.**
2. **Fluidextractum scopolae. Dose, 0,05 Cc.**

SCOPOLAMINAE HYDROBROMIDUM. (Sko-po-lam-i'-ne hi-dro-bro'-mid-um.) **Scopolaminae hydrobromidi. Scopolamine hydrobromide.**

The hydrobromide of an alkaloid obtained from plants of the Solanaceae; chemically identical with hyoscine hydrobromide.

Colorless, hygroscopic crystals, soluble in water and in alcohol.

Inc.—See alkaloids.

Uses and adm.—See hyoscinae hydrobromidum. **Dose, 0,0005 Gm.**

SCUTELLARIA. (Sku-tel-a'-re-ah.) **Scutellariae. Scutellaria.** Syn.—Skullcap. The dried plant of *Scutellaria lateriflora.*

Smooth, quadrangular stem and branches, with ovate-lanceolate or ovate-oblong leaves, and pale-blue, two lipped flowers; odor slight; taste bitterish.

Comp.—Bitter principle.

Uses.—Tonic (?). **Dose, 1 Gm.**

Prep.—**Fluidextractum scutellariae. Dose, 1 Cc.**

SENEGA. (Sen'-e-ga.) **Senegae. Senega.** The dried root of *Polygala senega.*

A fleshy, somewhat tortuous, branched brownish-yellow

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Inc.—The official preparations contain potassium hydrate; hence have the incompatibilities of fixed alkalies. (See potassii hydroxidum.)

Uses.—Stimulant expectorant, emetic. **Dose, 1 Gm.**

Prep.—1. **Fluidextractum senegae. Dose, 1 Cc.**

2. **Syrupus senegae.** (Fluidextract, 20%.) **Dose, 4 Cc.**

Adm.—With flavoring syrup, e.g., tolu, or orange.

SENNA. (Sen'-ah.) **Sennae. Senna.** The dried leaflets of *Cassia acutifolia*, or of *Cassia angustifolia*.

Small, lanceolate, grayish-green with entire margin, odor characteristic; taste somewhat mucilaginous and bitterish.

Comp.—Cathartinic acid, a glucoside, is the chief purgative principle; Chrysophanic acid; the glucosides sennacrol and sennapicrin, which are insoluble in water.

Uses.—Purgative. **Dose, 4 Gm.**

Prep.—1. **Fluidextractum sennae. Dose, 2 Cc.**

2. **Syrupus sennae.** (25% of fluidext.) **Dose, 4 Cc.**

3. **Infusum sennae compositum.** (6%.) **Dose, 120 Cc.**

4. **Pulvis glycyrrhizae compositus.** (18%.) **Dose, 4 Gm.**

5. **Confectio sennae.** (10%.) **Dose, 4 Gm.**

Adm.—In form of infusion, which may be sweetened and made aromatic. The compound infusion is a rather disagreeable preparation; the confection of senna and the compound powder of glycyrrhiza, on the other hand, are pleasant.

SERPENTARIA. (Ser-pen-ta'-re-ah.) **Serpentariae. Serpentaria.** Syn.—Virginia snakeroot. The dried rhizome and roots of *Aristolochia reticulata*.

Thin, small, yellowish-brown rhizome, with numerous stem-scars on upper side, and many rootlets on lower side; odor camphoraceous; taste bitter and aromatic.

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Comp.—Aristolochine, a bitter principle; volatile oil (⅓%); resin; tannic acid, in small quantity.

Uses.—Bitter stomachic. **Dose, 1 Gm.**

Prep.—**Fluidextractum serpentariae. Dose, 1 Cc.**

SERUM ANTIDIPHTHERITICUM. (Se′-rum an-ti-dif-ther-it′-ik-um.) **Seri antidiphtheritici. Diphtheria antitoxin.**

A fluid separated from the clotted blood of a horse, immunized through the inoculation of diphtheria antitoxin.

A yellowish or yellowish-brown, transparent, or slightly turbid liquid, odorless or having a slight odor, due to the presence of the antiseptic used as a preservative.

It should be kept in sealed glass containers, in a dark place, at temperatures between 4.5° and 15° C. (40° and 59° F.).

The unit (Ehrlich's) for measuring diphtheria antitoxin is a measure of strength not of quantity. It may be defined as that quantity of antitoxic serum which will just neutralize 200 minimum lethal doses of a pure diphtheria poison, i. e., a poison containing only toxin, and no other substances capable of uniting with the antibodies; the minimum lethal dose being that quantity of toxin which will surely kill every guinea pig weighing 250 Gm. in the course of four days, or, at the very latest, five days.

Each container should be furnished with a label or statement, giving the strength of the serum, expressed in antitoxic units, the name and percentage of antiseptic used, the date when the antitoxin was last tested, and the date beyond which it will not have the strength indicated on the label or statement. The serum gradually loses its power, the loss in one year varying between 10% and 30%.

Uses.—Prophylactic and curative in diphtheria. **Dose, 3000 units. Immunizing Dose** for well persons, **500 units.**

SEVUM PRAEPARATUM. (Se′-vum pre-pa-ra′-tum.) **Sevi praeparati. Prepared suet.** Syn.—Mutton suet.

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The internal fat of the abdomen of the sheep.

A white, solid fat, nearly inodorous, and having a bland taste when fresh, but becoming rancid on prolonged exposure to the air.

Sol.—Insoluble in water or cold alcohol; soluble in 44 of boiling alcohol, in about 60 of ether, and slowly in 2 of petroleum benzin.

Comp.—Stearin; palmitin; olein.

Inc.—See olea fixa.

Uses.—Emollient.

SINAPIS ALBA. (Sin'-a-pis al'-bah.) **Sinapis albae. White mustard.** The seed of *Sinapis alba.*

Small, globular yellowish seeds; inodorous when dry, but of a strong characteristic odor when moistened; taste mildly pungent and acrid.

Comp.—Fixed oil (25%); sinalbin, a glucoside; and myrosin, a ferment; the two last mentioned ingredients produce, in the presence of water, acrinyl sulphocyanide, which is a fixed pungent body, sinapin sulphate and glucose.

Uses.—Condiment; emetic in **dose of 8 Gm.**

SINAPIS NIGRA. (Sin'-a-pis ni'-grah) **Sinapis nigrae. Black mustard.** The seed of *Brassica nigra.*

Small, globular reddish-black seeds; inodorous when dry, but when moistened developing an extremely pungent and irritating odor; taste strongly pungent and acrid.

Comp.—Fixed oil (35%); sinigrin, a glucoside; myrosin, a ferment; when the two last mentioned ingredients come in contact with water, volatile oil of mustard, a highly irritating body is produced.

Uses.—Rubefacient; condiment; emetic in **dose of 8 Gm.**

Prep.—**Charta sinapis.**

Prepared from black mustard by distillation: **Oleum sinapis volatile.** Volatile oil of mustard. **Dose, 0,008 Cc.**

SODII ACETAS. (So'-de-i as-e'-tas.) **Sodii aceta'tis. Sodium ac'etate.**

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Colorless, transparent, monoclinic prisms, or a granular crystalline powder, odorless, and having a cooling saline taste. Efflorescent in warm dry air.

Sol.—1 of water, 23 of alcohol.

Inc.—See acidum aceticum.

Uses.—Diuretic. **Dose, 1 Gm.**

Adm.—In aromatic water, sweetened with syrup.

SODII ARSENAS. (So'-de-i ar'-sen-as.) **Sodii arsena'tis. Sodium arsenate.**

Colorless crystals, having a mild alkaline taste.

Sol.—1,2 of water, very sparingly soluble in alcohol.

Inc.—1. Precipitates neutral solutions of salts of **nearly all other common metals.**

2. Rather strong solution is precipitated by **tannic acid.**

3. Arsenates in acid solution oxidize **hypophosphites, sulphites,** and **iodides.**

4. Sodium arsenate precipitates solutions of many **alkaloidal salts.**

Uses.—Tonic, alterative, hematinic. **Dose, 0,005 Gm.**

Prep.—**Sodii arsenas exsiccatus. Dose, 0,003 Gm.**

Prep.—**Liquor sodii arsenatis.** (1%.) **Dose, 0,2 Cc.**

Adm.—In pill (with sugar of milk); or official solution with aromatic water and syrup.

SODII BENZOAS. (So'-de-i ben'-zo-as.) **Sodii benzoa'tis. Sodium benzoate.**

A white, amorphous, granular, or crystalline powder, odorless and having a sweetish, astringent taste.

Sol.—1,6 of water; 43 of alcohol.

Inc.—1. Concentrated aqueous solution gives precipitate of benzoic acid with **stronger acids.** (See acida).

2. Solutions of salts of **silver, mercury, lead,** neutral solution of **ferric salts,** and solutions of **quinine bisulphate** are precipitated.

Uses.—Antiseptic, expectorant, diuretic. **Dose, 1 Gm.**

SODII BICARBONAS. (So'-de-i bi-kar'-bon-as.) **Sodii bicarbona'tis. Sodium bicarbonate.** Syn.—Baking Soda.

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A white, opaque powder, odorless, and having a cooling mildly alkaline taste.

Sol.—In 12 of water at 15° C. (59° F.); above this temperature the solution gradually loses carbon dioxide and at boiling heat the salt is entirely converted into normal carbonate; insoluble in alcohol.

Inc.—Those of carbonates. (See potassii carbonas.)

Uses.—Antacid. **Dose, 1 Gm.**

Prep.—**Trochisci sodii bicarbonatis** (each 0,18 Gm.).

SODII BISULPHIS. (So'-de-i bi-sul'-fis). **Sodii bisulphi'tis. Sodium bisulphite.**

Opaque, prismatic crystals, or a granular powder, exhaling an odor of sulphur dioxide, and having a disagreeable, sulphurous taste.

Sol.—In 3,5 of water; 70 of alcohol.

Inc.—Acids.

Uses.—Antiseptic. **Dose, 0,50 Gm.**

SODII BORAS. (So'-de-i bo'-ras.) **Sodii bora'tis. Sodium borate.** Syn.—Borax.

Colorless crystals, or a white powder, having a sweetish, alkaline taste.

Sol.—20.4 of water; 1 of glycerin; insoluble in alcohol.

Inc.—1. Gives precipitates with nearly neutral solutions of salts of many metals; as **mercuric chloride, silver nitrate, lead acetate, zinc sulphate, ferric salts; alum, calcium chloride, barium chloride.** 2. Concentrated solutions give a precipitate of boric acid with **nearly all mineral acids.** 3. Being alkaline in reaction, it causes precipitation of alkaloid from **most alkaloidal salts.** 4. Glycerin, glucose, or honey liberate boric acid in solutions of borax, rendering such solutions incompatible with **carbonates,** but generally compatible with solutions of alkaloidal salts.

Uses.—Mild antiseptic. **Dose, 0,50 Gm.**

Adm.—Solution in aromatic water, e. g., peppermint water, sweetened with syrup or glycerin.

SODII BROMIDUM. (So'-de-i bro'-mid-um.) **Sodii bromidi. Sodium bromide.**

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Colorless or white cubical crystals, or a white granular powder, having a saline, slightly bitter taste.

Sol.—1.7 of water; 12.5 of alcohol.

Inc.—Those of bromides. (See acidum hydrobromicum.)

Uses.—Sedative nervine. **Dose, 1 Gm.**

Adm.—See potassii bromidum.

SODII CARBONAS MONOHYDRATUS. (So'-de-i kar'-bon-as mo-no-hi-dra'-tus.) **Sodii carbona'tis monohydrati. Monohydrated sodium carbonate.**

A white, crystalline, granular powder, odorless, and having a strongly alkaline taste.

Sol.—2.9 of water; 8 of glycerin; insoluble in alcohol and in ether.

Inc.—Those of carbonates. See potassii carbonas.

Uses.—Antacid; solvent. **Dose, 0,25 Gm.**

SODII CHLORAS. (So'-de-i klo'-ras.) **Sodii chlora'tis. Sodium chlorate.**

Colorless, transparent crystals, or a crystalline powder; odorless, having a cooling saline taste.

Sol.—In about 1 of water; 100 of alcohol; 5 of glycerin.

Inc., uses and adm.—See potassii chloras. **Dose, 0,25 Gm.**

SODII CHLORIDUM. (So'-de-i klo'-rid-um.) **Sodii chloridi. Sodium chloride.**

Colorless, transparent, cubical crystals, or a white crystalline powder, odorless and having a purely saline taste.

Sol.—In 2.8 of water; almost insoluble in alcohol.

Inc.—See acidum hydrochloricum.

Uses.—Local stimulant; condiment; emetic in **dose of 16 Gm.**

SODII CITRAS. (So'-de-i si'-tras.) **Sodii citra'tis. Sodium citrate.**

A white, granular powder, odorless, and having a cooling,

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SODII HYDROXIDUM. (So'-de-i hi-droks'-id-um.) **Sodii hydroxidi. Sodium hydroxide.** Syn.—Caustic soda.

Dry, white flakes, or fused masses.

Sol.—1 of water; very soluble in alcohol.

Inc., uses, and adm.—See potassii hydroxidum.

Prep.—**Liquor sodii hydroxidi.** (5%.) **Dose, 1 Cc.**

SODII HYPOPHOSPHIS. (So'-de-i hi-po-fos'-fis.) **Sodii hypophosphi'tis. Sodium hypophosphite.**

Small, colorless plates, or a white granular powder, odorless, and having a bitterish-sweet, saline taste. Very deliquescent.

Sol.—1 of water; 25 of alcohol; insoluble in ether.

Inc.—See acidum hypophosphorosum.

Uses.—Tonic. **Dose, 1 Gm.**

Prep.—**Syrupus hypophosphitum.** (1.5%.) **Dose, 8 Cc.**
Syrupus hypophosphitum compositus. (1.75%.) **Dose, 8 Cc.**

Adm.—In syrupy solution.

SODII IODIDUM. (Sod'-e-i i-od'-id-um.) **Sodii iodidi. Sodium iodide.**

Colorless, cubical crystals, or a white crystalline powder, having a saline and slightly bitter taste.

Sol.—0.5 of water; 3 of alcohol.

Inc.—See acidum hydriodicum.

Uses.—Alterative. **Dose, 0,50 Gm.**

Adm.—See potassii iodidum.

SODII NITRAS. (So'-de-i ni'-tras.) **Sodii nitra'tis. Sodium nitrate.**

Colorless, transparent, rhombohedral crystals, odorless, and having a cooling, saline, and slightly bitter taste. Hygroscopic in moist air.

Sol.—In about 1.1 of water and in about 100 of alcohol.

Inc.—See acidum nitricum.

Uses.—Diuretic. **Dose, 1 Gm.**

Adm.—Aqueous solution with syrup of citric acid.

SODII NITRIS. (So'-de-i ni'-tris.) **Sodii nitri'tis. Sodium nitrite.**

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White opaque, fused masses, or pencils, or colorless, transparent, hexagonal crystals; odorless, and having a mild saline taste. When exposed to the air, the salt deliquesces and is gradually oxidized to sodium nitrate.

Sol.—In about 1.4 of water; slightly in alcohol.

Inc.—Sodium nitrite, in acid solution, has incompatibilities of nitrous acid. (See spirit of nitrous ether.)

Uses.—Vaso-dilator. **Dose, 0,065 Gm.**

Adm.—In aromatic sweetened aqueous solution.

SODII PHENOLSULPHONAS. (So′-de-i fe-nol-sul′-fon-as.) **Sodii phenolsulphona′tis. Sodium phenolsulphonate.**

Syn.—Sodium sulphocarbolate.

Colorless, transparent, rhombic prisms, odorless and having a cooling, saline, bitter taste. Somewhat efflorescent.

Sol.—In 4.8 of water; 130 of alcohol.

Uses.—Antiseptic. **Dose, 0,25 Gm.**

Adm.—In aqueous solution sweetened with syrup of orange or syrup of ginger, when intended to act in the stomach. When action in the intestine is desired, it should be given in keratin-coated pills.

SODII PHOSPHAS. (So′-de-i fos′-fas.) **Sodii phospha′tis. Sodium Phosphate.**

Large, colorless crystals, or a granular, crystalline salt; odorless, and having a cooling, saline taste. The crystals effloresce on exposure to the air. It contains 60,3% of water of crystallization.

Sol.—5,5 of water; insoluble in alcohol.

Inc.—1. Precipitates neutral solutions of **nearly all other metals.**

2. It is slightly alkaline in reaction; and may precipitate some of the **alkaloids** from aqueous solutions of their salts.

3. It forms a liquid or a soft mass when rubbed with **lead acetate, phenol, chloral hydrate, salicylic acid.**

Uses.—Hydragogue purgative and cholagogue. **Dose, 2 Gm.**

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Prep.—1. **Sodii phosphas exsiccatus.** More than twice as strong as the crystallized salt. **Dose, 1 Gm.**

2. **Sodii phosphas effervescens.** (20%.) **Dose, 8 Gm.**

3. **Liquor sodii phosphatis compositus.** This solution is sodium phosphate liquefied in its water of crystallization by means of citric acid and sodium nitrate; so that 1 Cc. represents 1 Gm. of the crystallized salt. **Dose, 8 Cc.**

Adm.—In effervescing form; or in syrup, or milk.

SODII PYROPHOSPHAS. (So′-de-i pi-ro-fos′-fas.) **Sodii pyrophospha′tis. Sodium pyrophosphate.**

Colorless, transparent, monoclinic prisms, or a crystalline powder; odorless, and having a cooling, saline and feebly alkaline taste: slightly efflorescent in warm air.

Sol.—In about 11,5 of water; insoluble in alcohol.

Inc.—Precipitates solutions of salts of **nearly all other metals.**

Uses.—Mainly in preparation of ferric pyrophosphate. **Dose, 2 Gm.**

SODII SALICYLAS. (So′-de-i sal-is′-il-as.) **Sodii salicyla′tis. Sodium salicylate.**

White powder or scales, odorless and having a disagreeable sweetish, saline taste.

Sol.—0,8 of water; 5,5 of alcohol; also soluble in glycerin.

Inc.—See acidum salicylicum.

Uses.—Antiseptic; cholagogue; antirheumatic. **Dose, 1 Gm.**

Adm.—Dissolved in aromatic water (e. g., cinnamon water, or peppermint water), sweetened with flavoring syrup (e. g., syrup of orange); to be taken freely diluted; preferably with carbonated water or milk.

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Sol.—2,8 of water; insoluble in alcohol; soluble in glycerin.

Inc.—See acidum sulphuricum.

Uses.—Hydragogue purgative. **Dose, 16 Gm.**

Adm.—In lemonade, preferably ice cold and effervescing.

SODII SULPHIS. (So'-de-i sul'-fis.) **Sodii sulphi'tis. Sodium sulphite.**

Colorless, transparent, monoclinic prisms; odorless and having a cooling, saline, sulphurous taste; efflorescent in air; becomes slowly oxidized to sulphate.

Sol.—In 2 of water, sparingly in alcohol.

Inc.—Acids.

Uses.—Antiseptic. **Dose, 1 Gm.**

Adm.—In aromatic water, e. g., chloroform water.

SODII THIOSULPHAS. (So'-de-i thi-o-sul'-fas.) **Sodii thiosulpha'tis. Sodium thiosulphate.** Syn.—Sodium hyposulphite.

Colorless, transparent, monoclinic prisms, odorless and having a cooling, afterwards bitter taste.

Sol.—In about 0,35 of water; insoluble in alcohol; slightly soluble in oil of turpentine.

Inc.—1. Nearly all **acids.**

2. Precipitates aqueous solutions of **barium, silver, lead,** and **mercurous** salts.

3. In acid solutions it is a powerful reducing agent; incompatible with **oxidizing** agents; dry trituration with the most potent of which is liable to result in explosion.

Uses.—Antiseptic. **Dose, 1 Gm.**

Adm.—Externally in 10% lotion or ointment, internally in flavored sweetened solution.

SPARTEINAE SULPHAS. (Spar-te-i'-ne sul'-fas.) **Sparteinae sulpha'tis. Sparteine sulphate.** The sulphate of an alkaloid obtained from Scoparius.

Colorless, rhombohedral crystals, or a crystalline powder; odorless, and having a slight saline and somewhat bitter taste. Liable to attract moisture when exposed to damp air.

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Sol.—In 1,1 of water; 2,40 of alcohol; **insoluble in ether** and chloroform.

Inc.—See alkaloids.

Uses.—**In heart disease, especially functional. Dose, 0,01 Gm.**

Adm.—In pill or hypodermically.

SPIGELIA. (Spi-je'-le-ah.) **Spigeliae. Spigelia.** Syn.—Pinkroot. The dried rhizome and roots of *Spigelia marilandica.*

Small, knotty, dark purplish-brown or blackish rhizome, with several stem-scars, and numerous rootlets; odor somewhat aromatic; taste bitter and pungent.

Comp.—Spigeline, a volatile alkaloid; bitter principle; volatile oil; resin; tannic acid.

Uses.—Anthelmintic against round worm. **Dose, 4 Gm.**

Prep.—**Fluidextractum spigeliae. Dose, 4 Cc.**

SPIRITUS. See p. 90.

SPIRITUS AETHERIS NITROSI. (Spir'-it-us e'-ther-is ni-tro'-si.) **Spiritus aetheris nitrosi. Spirit of nitrous ether.** Syn.—Sweet spirit of nitre. An alcoholic solution of ethyl nitrite, containing not less than 4% of ethyl nitrite.

A clear, pale-yellowish or faintly greenish-yellow liquid; having a fragrant, ethereal, and pungent odor; and a sharp burning taste. When freshly prepared, it is neutral; but, on keeping, it becomes acid.

Sol.—Mixable with water and alcohol.

Inc.—1. **Alkali hydrates** decompose ethyl nitrite, **forming** alcohol and a nitrite of the alkali.

2. Spirit of nitrous ether, especially when it has become acid, may act as oxidizing or as reducing agent. It oxidizes **hypophosphites, sul-**

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3. Color reactions are produced with: **antipyrin,** green; **acetanilide,** yellow; **phenol,** yellow; **thymol,** green; **morphine,** yellow; **guaiac,** blue to red.

4. Evolution of gas occurs, when nitrites in acid solution, are mixed with **acetates** or with **gallic** or **tannic acids,** or substances containing them in large amount.

Uses.—Diaphoretic; diuretic; antispasmodic. **Dose, 2 Cc.**

Adm.—May be prescribed with syrup; and given well diluted with water.

SPIRITUS GLYCERYLIS NITRATIS. (Spir'-it-us glis-er-i'-lis ni-tra'-tis.) **Spiritus glycerylis nitratis. Spirit of glyc'eryl trinitrate.** Spirit of nitroglycerin. Syn.—Spiritus glonoini (U. S. P. 1890), Solution of trinitrin.

An alcoholic solution containing 1% of glyceryl trinitrate.

A clear, colorless liquid having the odor and taste of alcohol.

Sol.—Mixable with alcohol in all proportions; it may be mixed with about equal quantity of water; excess of water causes white turbidity.

Inc.—1. **Alkalies and their carbonates** decompose the nitroglycerin.

2. If the alcohol be allowed to evaporate, the nitroglycerin may become sufficiently concentrated to explode violently on percussion.

Uses.—Vaso-dilator. **Dose, 0,05 Cc.**

Adm.—Dissolved in aromatic elixir; or in form of tablets (containing from 0,0001 to 0,001 Gm. of nitroglycerin); or hypodermically.

STAPHISAGRIA. (Staf-is-a'-gre-ah.) **Staphisagriae. Staphisagria.** Syn.—Stavesacre. The ripe seed of *Delphinium staphisagria*

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Comp.—The alkaloids, delphinine (resembling aconitine), delphinoidine, delphisine, and staphisagrine. Also present 25% of fixed oil.

Uses.—Parasiticide. **Dose, 0,065 Gm.**

Prep.—**Fluidextractum staphisagriae. Dose, 0,05 Cc.**

STILLINGIA. (Stil-in'-je-ah.) **Stillingiae. Stillingia.** Syn.—Queen's root. The dried root of *Stillingia sylvatica.*

Woody reddish-brown root, with thick, easily separable bark; odor distinct; taste bitter, acrid, and pungent.

Comp.—Sylvacrol, an acrid resin; volatile oil; probably a glucoside; tannic acid.

Uses.—Alterative. **Dose, 2 Gm.**

Prep.—**Fluidextractum stillingiae. Dose, 2 Cc.**

STRAMONIUM. (Stra-mo'-ne-um.) **Stramonii. Stramonium.** Syn.—Thorn apple, Jamestown weed. The dried leaves of *Datura stramonium.*

Thin, brittle, dark-green leaves, margin irregularly lobed or toothed; odor distinct, narcotic; taste nauseous.

Comp.—Alkaloids, not less than 0,35%, chief of which is daturine, probably identical with hyoscyamine. Also present fixed oil (25%).

Inc.—See atropina.

Uses.—Like those of belladonna. (q. v.) **Dose, 0,065 Gm.**

Prep.—1. **Extractum stramonii. Dose, 0,01 Gm.**
2. **Fluidextractum stramonii. Dose, 0,05 Cc.**
3. **Tinctura stramonii.** (10%.) **Dose, 0,50 Cc.**
4. **Unguentum stramonii.** (Extract, 10%.)

Adm.—The extract in pills. The tincture in aromatic water, with flavoring syrup, e. g., syrup of orange.

STRONTII BROMIDUM. (Stron'-she-i bro'-mid-um.) **Strontii bromidi. Strontium bromide.**

Colorless, transparent, hexagonal crystals, odorless and having a bitter saline taste. Very deliquescent.

Sol.—In about 1 of water; readily soluble in alcohol; insoluble in ether.

Inc.—(a) Salts of strontium are precipitated from aqueous solution by soluble **carbonates, phosphates,** or **oxalates;** from concentrated solutions by

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soluble **sulphates, chromates,** or **alkali hydrates.**

(b) Those of bromides. (See acidum hydrobromicum.)

Uses.—Sedative nervine. **Dose, 1 Gm.**

Adm.—See potassii bromidum.

STRONTII IODIDUM. (Stron'-she-i i-od'-id-um.) **Strontii iodidi. Strontium iodide.**

Colorless, transparent, hexagonal plates, odorless and having a bitter, saline taste. Deliquescent, and colored yellow by exposure to air and light.

Sol.—0,5 of water; soluble in alcohol, and slightly soluble in ether.

Inc.—See strontii bromidum and acidum hydriodicum.

Uses.—Alterative. **Dose, 0,50 Gm.**

Adm.—See potassii iodidum.

STRONTII SALICYLAS. (Stron'-she-i sal-is'-il-as.) **Strontii salicyla'tis. Strontium salicylate.**

A white, crystalline powder, odorless, and having a sweetish, saline taste.

Sol.—18 of water; 66 of alcohol.

Inc.—See strontii bromidum and acidum salicylicum.

Uses.—Antiseptic; cholagogue; antirheumatic. **Dose, 1 Gm.**

Adm.—See sodii salicylas.

STROPHANTHINUM. (Strof-an'-thin-um.) **Strophanthini. Strophan'thin.**

A glucoside, or mixture of glucosides, obtained from strophanthus.

A white, or faintly yellowish crystalline powder; taste intensely bitter; permanent in the air.

Sol.—Very soluble in water and in diluted alcohol; less soluble in absolute alcohol; nearly insoluble in ether, chloroform, and benzene.

Inc.—Changed by sulphuric acid to glucose and strophanthidin.

Uses.—Heart stimulant. **Dose, 0,0003 Gm.**

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Adm.—In pill form (with sugar of milk), or hypodermically.

STROPHANTHUS. (Strof-an'-thus.) **Strophanthi. Strophanthus.** The ripe seed of *strophanthus hispidus*, deprived of its long awn.

Rather long, narrow, lanceolate, grayish-green seeds, covered with closely appressed silky hairs; odor slight, or heavy when the seeds are crushed and moistened; taste very bitter.

Comp.—Strophanthin, a glucoside (see above); kombic acid; ineine, an alkaloid; tanghinin; etc.

Uses.—Heart stimulant. **Dose, 0,065 Gm.**

Prep.—**Tinctura strophanthi.** (10%.) **Dose, 0,5 Cc.**

Adm.—The tincture may be prescribed in aromatic elixir.

STRYCHNINA. (Strik-ni'-nah.) **Strychninae. Strych'nine.** An alkaloid obtained from *Nux vomica* and other plants of the Loganiaceae.

Colorless, transparent, prismatic crystals, or a white crystalline powder, odorless, and having an intensely bitter taste, perceptible even in highly dilute (1 in 700,000) solution. Only extremely diluted solutions should be tasted. Permanent in the air.

Sol.—In 6400 of water; 110 of alcohol; 5500 of ether; 6 of chloroform; 150 of benzene.

Inc.—The general alkaloidal reagents. (See alkaloids.)

Uses.—See strychninae sulphas. **Dose, 0,001 Gm.**

Adm.—Generally in form of strychnine sulphate. (q. v.)

STRYCHNINAE NITRAS. (Strik-ni'-ne ni'-tras.) **Strychninae nitra'tis. Strych'nine nitrate.**

Colorless, glistening needles; odorless, and having an intensely bitter taste; permanent in the air.

Sol.—In 42 of water; 120 of alcohol; 156 of chloroform; 60 of glycerin; insoluble in ether.

Inc.—See alkaloids.

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STRYCHNINAE SULPHAS. (Strik-ni'-ne sul'-fas.) **Strychninae sulpha'tis. Strych'nine sulphate.**

Colorless, or white, prismatic crystals, odorless and having an intensely bitter taste perceptible even in highly dilute solution. Efflorescent in dry air.

Sol.—In 31 of water; 65 of alcohol; and in 325 of chloroform; insoluble in ether.

Inc.—See alkaloids.

Uses.—Circulatory stimulant, respiratory stimulant, excito-motor, stomachic. **Dose, 0,001 Gm.**

Adm.—In pill with sugar of milk. Hypodermically in aqueous solution.

STYRAX. (Sti'-raks.) **Styra'cis. Storax.** A balsam prepared from the wood and inner bark of *Liquidambar orientalis.*

A semi-liquid, grayish, sticky, opaque mass, depositing, on standing, a heavy, dark-brown stratum: transparent in thin layers, and having an agreeable odor and a balsamic taste.

Sol.—Insoluble in water, but completely soluble in an equal weight of warm alcohol.

Comp.—Styrol or cinnamene, a volatile oil; Cinnamic acid; etc.

Uses.—The same as those of the balsams of tolu and peru. **Dose, 1 Gm.**

SULPHONETHYLMETHANUM. (Sul-fon-eth'-il-me-tha'-num.) **Sulphonethylmethani. Sulphonethylmethane.** Syn.—Trional.

Shining, colorless, odorless, crystalline scales, which have a bitter taste in aqueous solution.

Sol.—In 195 of water; more soluble in boiling water; readily in alcohol and ether.

Inc.—Liquefaction or softening results when rubbed with **chloral hydrate** or **phenyl salicylate.**

Uses.—Hypnotic. **Dose, 1 Gm.**

Adm.—In capsule; or in powder, to be taken in hot water or in hot milk.

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SULPHONMETHANUM. (Sul-fon-me-tha'-num.) **Sulphonmethani. Sulphonmethane.** Syn.—Sulphonal.

Colorless, inodorous, and nearly tasteless prismatic crystals.

Sol.—360 of water; 15 of boiling water; 47 of alcohol; 45 of ether, and 16 of chloroform; soluble in benzene.

Inc.—Liquefies when triturated with **chloral hydrate.**

Uses.—Hypnotic. **Dose, 1 Gm.**

Adm.—In capsule; or in powder to be taken in hot water or in hot milk.

SULPHUR is official in three forms:

SULPHUR SUBLIMATUM. (Sul'-fur sub-lim-a'-tum.) **Sulphuris sublimati. Sublimed sulphur.** Syn.—Flowers of sulphur.

A fine, yellow powder, having a slight characteristic odor and a faintly acid taste.

Sol.—Insoluble in water; slightly soluble in absolute alcohol; more readily soluble in petroleum benzin, benzene, oil of turpentine, and many other oils, also in ether, in chloroform, and in boiling aqueous solutions of alkaline hydroxides.

Inc.—Sulphur is a reducing agent; and if it is triturated dry with strong **oxidizing agents,** as potassium chlorate or permanganate, explosion is liable to result.

Uses.—See washed sulphur. **Dose, 4 Gm.**

SULPHUR LOTUM. (Sul'-fur lo'-tum.) **Sulphuris loti. Washed sulphur.**

Sublimed sulphur washed with diluted ammonia water to remove traces of sulphuric acid and other impurities.

A fine, yellow powder, without odor or taste.

Sol.—Same as that of sublimed sulphur.

Inc.—Same as those of sublimed sulphur.

Uses.—Irritant, antiparasitic, laxative, alterative. **Dose, 4 Gm.**

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aromatic powder. Dose may be taken in milk, or in molasses.

SULPHUR PRAECIPITATUM. (Sul'-fur pre-sip-it-a'-tum.) **Sulphuris praecipitati. Precipitated sulphur.** Syn.—Milk of sulphur. Lac sulphuris.

Sublimed sulphur dissolved in water by means of calcium hydroxide, and then precipitated by hydrochloric acid.

A fine, amorphous powder, of a pale yellow color, without odor or taste.

Sol. and Inc.—Same as sublimed sulphur.

Uses.—See washed sulphur. **Dose, 4 Gm.**

SULPHURIS IODIDUM. (Sul'-fur-is i-od'-id-um.) **Sulphuris iodidi. Sulphur iodide.**

Brittle masses of a crystalline fracture and a grayish-black, metallic lustre, having the odor of iodine and a somewhat acrid taste.

Sol.—Almost insoluble in water; soluble in 60 of glycerin; very soluble in carbon disulphide. Alcohol or ether dissolve out the iodine, leaving the sulphur. It is doubtful whether it is really a distinct chemical compound or merely a physical mixture.

Uses.—Skin irritant, antiseptic, alterative.

SUMBUL. (Sum'-bul.) **Sumbul. Sumbul.** Syn.—Musk root.

The dried rhizome and root of an undetermined plant, probably of the family Umbelliferae.

Transverse sections of a light spongy root,' externally dusky brown, annulate, internally whitish; odor strong, musk-like; taste bitter.

Comp.—A volatile oil; resins; valeric, sumbulic, and angelic acids.

Uses.—Antispasmodic in hysteria. **Dose, 2 Gm.**

Prep.—1. **Extractum sumbul. Dose, 0,25 Gm.**

2. **Fluidextractum sumbul. Dose. 2 Cc.**

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SYRUPI. See p. 83.

TALCUM. (Tal'-kum.) **Talci. Talc.** Syn.—French chalk. Magnesium silicate.

Fine, white, slippery powder, odorless, tasteless, insoluble.

Uses.—Simple dusting powder.

Prep.—**Talcum purificatum.** Purified talc is used in the preparation of some of the aromatic waters.

TAMARINDUS. (Tam-ar-in'-dus.) **Tamarindi. Tam'arind.** The preserved pulp of the fruit of *Tamarindus indica.*

A pulpy mass of a light reddish-brown color, darkening with age, containing some branching fibres and numerous reddish-brown, smooth, oblong or quadrangular, compressed seeds, each enclosed in a tough membrane; odor distinct; taste sweet and agreeably acid.

Comp.—Tartaric, citric, malic and acetic acids; sugar; pectin; tannic acid; potassium compounds, etc.

Uses.—Laxative; refrigerant. **Dose, 16 Gm.**

Adm.—In confection.

TARAXACUM. (Tar-aks'-ak-um.) **Taraxaci. Taraxacum.** Syn.—Dandelion. The dried root of *Taraxacum officinale.*

A fleshy root, odorless, bitter.

Comp.—Taraxacin, a crystalline, bitter principle, soluble in water and alcohol; taraxacerin; inulin; etc.

Uses.—Stomachic; mildly laxative; diuretic. **Dose, 8 Gm.**

Prep.—1. **Extractum taraxaci. Dose, 1 Gm.**

2. **Fluidextractum taraxaci. Dose, 8 Cc.**

TEREBENUM. (Ter-e-be'-num.) **Terebeni. Ter'ebene.**

A liquid consisting of dipentene and other hydrocarbons, obtained from oil of turpentine.

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Uses.—Expectorant, diuretic. **Dose, 0,5 Cc.**
Adm.—On sugar; in milk; or in emulsion.

TEREBINTHINA. (Ter-e-bin'-thin-ah.) **Terebinthinae. Turpentine.**
A concrete oleoresin obtained from *Pinus palustris* and other species of Pinus.
Yellowish, opaque masses, odor and taste terebinthinate.
Oil of turpentine and resin are obtained from it.

TEREBINTHINA CANADENSIS. (Ter-e-bin'-thin-ah kan-a-den'-sis.) **Terebinthinae canadensis. Canada turpentine.** Syn.—Canada balsam. Balsam of Fir.
A liquid oleoresin obtained from *Abies balsamea.*
A yellowish or faintly greenish, transparent, viscid liquid, of an agreeable, terebinthinate odor, and a bitterish, slightly acrid taste. When exposed to the air, it gradually dries, forming a transparent varnish.
Sol.—Complete in ether, chloroform, or benzene.
Comp.—A volatile oil (20 to 30%); resin; bitter principle, soluble in water.
Uses.—Same as oil of turpentine.

TERPINI HYDRAS. (Ter-pi'-ni hi'-dras.) **Terpini hydra'tis. Ter'pin hydrate.** Obtained from rectified oil of turpentine.
Colorless, lustrous, rhombic prisms, nearly odorless, and having a slightly aromatic and somewhat bitter taste. Permanent in the air.
Sol.—In about 200 of water; 10 of alcohol; 100 of ether; 200 of chloroform.
Uses.—Expectorant and diuretic. **Dose, 0,125 Gm.**
Adm.—In pills, capsules or elixir.

THYMOL. (Thi'-mol.) **Thy'molis. Thymol.**
A phenol occurring in the volatile oil of *Thymus vulgaris* and in some other volatile oils.
Large, colorless, translucent rhombic crystals, having an aromatic, thyme-like odor, and a pungent, aromatic taste, with a very slight caustic effect upon the lips.
Sol.—In about 1100 of water; in less than its own weight

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of alcohol, ether, or chloroform; also soluble in glacial acetic acid, and in fixed or volatile oils.

Inc.—1. With **alkalies** it forms soluble salts.
2. With **bromine,** or **iodine** it yields precipitate.
3. With **spirit of nitrous ether** green to brown color.
4. It is a reducing agent incompatible with **strong oxidizers.**
5. **Liquefaction or softening results on trituration** with **phenol, menthol, camphor, chloral hydrate, ethyl carbamate, phenyl salicylate, acetanilide** or **antipyrine.**

Uses.—Antiseptic, anthelmintic. **Dose, 0,125 Gm.**

Adm.—In capsules, cachets or pills.

THYMOLIS IODIDUM. (Thi'-mol-is i-od'-id-um.) **Thymolis iodidi. Thymol i'odide.** Syn.—Aristol. Dithymol diiodide.

A bright, chocolate-colored, or reddish-yellow, bulky powder, with a very slight aromatic odor.

Sol.—Insoluble in water and glycerin; soluble in 675 of alcohol; readily soluble in ether, chloroform, collodion and in fixed and volatile oils.

Uses.—Antiseptic dusting powder.

TINCTURAE. See p. 114.

TRAGACANTHA. (Trag-a-kan'-thah.) **Tragacanthae. Tragacanth.** The concrete juice of various species of Astragalus.

Large, whitish, horny, waved flakes; odorless and nearly tasteless.

Comp.—53 parts arabin, 33 parts bassorin, both of which are gummy principles, the latter differing from the former by not dissolving in water, but simply swelling up into a paste.

Inc.—Its aqueous mixture is thickened by **alcohol,** by **lead acetate,** and **lead subacetate.**

Uses.—Demulcent; excipient; suspending agent.

Prep.—**Mucilago tragacanthae.** (6%.) **Dose, 16 Cc.**

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TRITICUM. (Trit'-ik-um.) **Tritici. Triticum.** Syn.—Couch-grass. The dried rhizome of *Agropyron repens.*

A long, thin, hollow rhizome; straw-colored; odor slight; taste distinctly sweet.

Comp.—Triticin (resembling inulin) about 8%; glucose; gum, etc.

Uses.—Demulcent, diuretic (?). **Dose, 8 Gm.**

Prep.—**Fluidextractum tritici. Dose, 8 Cc.**

TRITURATIONES. See p. 143.

TROCHISCI. See p. 158.

ULMUS. (Ul'-mus.) **Ulmi. Elm.** Syn.—Slippery elm. The dried bark of *Ulmus fulva* deprived of its periderm.

Large, flat, fibrous, woody pieces of slight odor and mucilaginous taste.

Comp.—Mucilage; starch; some tannic acid.

Uses.—Demulcent.

Prep.—**Mucilago ulmi.** (6%.) **Dose, 16 Cc.**

UNGUENTA. See p. 179.

UVA URSI. (U'-vah ur'-si.) **Uvae ursi. Uva ursi.** Syn.—Bearberry. The dried leaves of *Arctostaphylos uva-ursi.*

Obovate, small leaves, margin entire, upper surface dark-green, finely reticulate, lower surface slightly pubescent; odor faint; taste strongly astringent, and somewhat bitter.

Comp.—The bitter, crystalline glucosides, arbutin and ericolin. There are also present ursone, a tasteless neutral body; tannic acid (6 to 7%), etc.

Inc.—Those of tannic acid. Decomposes **spirit of nitrous ether** with active evolution of gas.

Uses.—Diuretic; urinary antiseptic; astringent. **Dose, 2 Gm.**

Prep.—**Fluidextractum uvae ursi. Dose, 2 Cc.**

Adm.—Fluidextract with aromatic elixir.

VALERIANA. (Va-le-re-an'-ah.) **Valerianae. Valerian.** The dried rhizome and roots of *Valeriana officinalis.*

Short, thick, upright, brown or yellowish-brown rhizome

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with many slender, brittle rootlets; odor characteristic; taste camphoraceous and somewhat bitter.

Comp.—A volatile oil (½ to 2%), consisting of borneol and pinene; valeric acid; formic, acetic, and malic acids; tannic acid; resin.

Uses.—Antispasmodic in hysteria, nervousness. **Dose, 2 Gm.**

Prep.—1. **Fluidextractum valerianae. Dose, 2 Cc.**
2. **Tinctura valerianae.** (20%.) **Dose, 4 Cc.**
3. **Tinctura valerianae ammoniata.** (20%.) **Dose, 2 Cc.**

Adm.—The tinctures in aromatic elixir.

VANILLA. (Van-il'-ah.) **Vanillae. Vanilla.** The cured, full-grown, but immature fruit of *Vanilla planifolia*.

A long, dark-brown fleshy pod, containing a blackish-brown pulp with numerous minute blackish seeds; odor and taste very fragrant.

Comp.—Vanillin, a crystalline principle (7 to 7.2%); fixed oil; resin; sugar; mucilage, etc.

Uses.—Flavoring agent.

Prep.—**Tinctura vanillae.** (10%.) **Dose, 1 Gm.**

VANILLINUM. (Van-il-i'-num.) **Vanillini. Vanill'in.** Occurring naturally in vanilla, or made artificially.

Fine, white, crystalline needles, having the odor and taste of vanilla, and an acid reaction.

Sol.—100 of water; readily in alcohol, ether, glycerin, or chloroform.

Uses.—Flavoring agent. **Dose, 0,03 Gm.**

VERATRINA. (Ver-at-ri'-nah.) **Veratrinae. Vera'trine.** A mixture of alkaloids obtained from the seed of *Asagroea officinalis*.

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Sol.—1750 of water; 2,2 of alcohol; 3 of ether; 1 of chloroform; very soluble in benzene and amyl alcohol; insoluble in petroleum benzin.

Uses.—Local analgesic. **Dose, 0,002 Gm.**

Prep.—1. **Oleatum veratrinae.** (2%.)
2. **Unguentum veratrinae.** (4%.)

VERATRUM. (Ver-a'-trum.) **Veratri. Veratrum. Syn.**—Hellebore. The dried rhizome and roots of *Veratrum viride* or *Veratrum album.*

Thick, rather short upright ovoid rhizome of blackish color, having numerous rather thick roots emanating from all sides. Inodorous, but strongly sternutatory when powdered; taste bitterish and very acrid.

Comp.—Six alkaloids, the most important of which are jervine and rubijervine. Present in only very minute quantity are: Pseudojervine, cevadine, veratrine, veratralbine.

Uses.—Circulatory depressant. **Dose, 0,125 Gm.**

Prep.—1. **Fluidextractum veratri. Dose, 0,1 Cc.**
2. **Tinctura veratri.** (10%.) **Dose, 1 Cc.**

VIBURNUM OPULUS. (Vi-bur'-num op'-ul-us.) **Viburni opuli. Viburnum opulus.** Syn.—Cramp bark. The dried bark of *Viburnum opulus.*

Somewhat curved pieces, outer surface grayish-brown, inner surface light-brown; odor slight; taste somewhat astringent and bitter.

Comp.—Like viburnum prunifolium. See below.

Uses.—Like viburnum prunifolium. See below. **Dose, 2 Gm.**

Prep.—**Fluidextractum vibruni opuli. Dose, 2 Cc.**

VIBURNUM PRUNIFOLIUM. (Vi-bur'-num pru-nif-o'-le-um.) **Viburni prunifolii. Viburnum prunifolium.** Syn.—Black haw. The dried bark of the root of *Viburnum prunifolium,* or of *Viburnum lentago.*

Thin quills or troughs, externally dingy brown, internally rust brown; odor slight, peculiar; taste very bitter, somewhat astringent.

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Comp.—Brown, bitter resin; virburnin, a bitter principle; valeric acid; tannic acid; oxalates, citrates, malates, etc.

Uses.—Antispasmodic, especially in uterine colic. **Dose, 2 Gm.**

Prep.—**Fluidextractum viburni prunifolii. Dose, 2 Cc.**

VINA. See p. 124.

XANTHOXYLUM. (Zan-thoks'-il-um.) **Xanthoxyli. Xanthoxylum.**. Syn.—Prickly ash bark. The dried bark of *Xanthoxylum americanum,* or of *Fagara clava-herculis.*

Curved or quilled fragments, outer surface brownish-gray or purplish-gray with large whitish patches, and minute black dots, and some brown, glossy two-edged spines; inner surface whitish, smooth; inodorous; taste bitterish, very pungent.

Comp.—Acrid green oil; acrid soft resin; bitter principle, probably alkaloid; tannic acid, small quantity.

Uses.—Alterative. **Dose, 2 Gm.**

Prep.—**Fluidextractum xanthoxyli. Dose, 2 Cc.**

ZEA. (Ze'-ah.) **Zeae. Zea.** Syn.—Corn-silk. The dried styles and stigmas of *Zea Mays.*

Thread-like; yellowish or brownish; nearly inodorous; taste faintly sweetish with a characteristic flavor.

Comp.—Maizenic acid, about 2%; fixed oil; resin, etc.

Uses.—Diuretic.

ZINCI ACETAS. (Zin'-si a-se'-tas.) **Zinci aceta'tis. Zinc acetate.**

Soft, white, six-sided monoclinic plates, of a pearly lustre, having a faintly acetous odor, and in diluted solutions an astringent, metallic taste; efflorescent.

Sol.—In about 2,5 of water; in 36 of alcohol.

Inc.—See zinci chloridum.

Uses.—Astringent. **Dose, 0,125 Gm.**

Adm.—See zinci sulphas.

ZINCI BROMIDUM. (Zin'-si bro'-mid-um.) **Zinci bromidi, Zinc bromide.**

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A white granular powder, odorless, and having a sharp, saline and metallic taste; very deliquescent.

Sol.—Readily in water and in alcohol.

Inc.—See zinci chloridum and acidum hydrobromicum.

Uses.—Sedative nervine. **Dose, 0,125 Gm.**

ZINCI CARBONAS PRAECIPITATUS. (Zin′-si kar′-bon-as pre-sip-it-a′-tus.) **Zinci carbona′tis praecipitati. Precipitated zinc carbonate.**

An impalpable, white powder, of somewhat variable chemical composition, without odor or taste. Permanent in the air.

Sol.—Insoluble in water or alcohol; completely soluble in diluted acids with copious effervescence; also soluble in ammonia water and in ammonium carbonate solution.

Inc.—Acids.

Uses.—Astringent dusting powder.

ZINCI CHLORIDUM. (Zin′-si klo′-rid-um.) **Zinci chloridi. Zinc chloride.** Syn.—Butter of zinc.

A white, granular powder, or porcelain-like masses, irregular, or moulded into pencils; odorless, of such intensely caustic properties as to make tasting dangerous, unless the salt be dissolved in much water, when it has an astringent, metallic taste. Very deliquescent.

Sol.—In about 0,4 of water; very soluble in alcohol.

Inc.—(a) Those of zinc salts.

1. Fixed **alkali hydrates, carbonates, phosphates, arsenates, cyanides, borax, tannic acid.**
2. They coagulate **albumen.**

(b) Those of chlorides, see acidum hydrochloricum.

Uses.—Caustic.

Prep.—**Liquor zinci chloridi.** (50%.)

ZINCI IODIDUM. (Zin′-si i-od′-id-um.) **Zinci iodidi. Zinc i′odide.**

A white, granular powder, odorless, and having a sharp saline and metallic taste. Very deliquescent, and upon exposure to air and light, becoming brown.

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Sol.—Readily in water, alcohol or ether.
Inc.—See zinci chloridum and acidum **hydriodicum.**
Uses.—Alterative. **Dose, 0,065 Gm.**

ZINCI OXIDUM. (Zin'-si oks'-id-um.) **Zinci oxidi. Zinc oxide.**
A very fine, amorphous, white or yellowish-white powder, odorless and tasteless.
Sol.—Insoluble in water or alcohol.
Inc.—Dissolved by **diluted acids, ammonia water,** and by **ammonium carbonate solution.**
Uses.—Astringent dusting powder. **Dose, 0,25 Gm.**
Prep.—**Unguentum zinci oxidi.** (20%.)

ZINCI PHENOLSULPHONAS. (Zin'-si fe-nol-sul'-fon-as.) **Zinci phenolsulphona'tis. Zinc phenolsulphonate.**
Syn.—Zinc sulphocarbolate.
Transparent, rhombic prisms or tabular crystals, odorless, and having an astringent, metallic taste. Exposed to the air the salt effloresces, and upon exposure to light and air may become slightly pink.
Sol.—In 1,7 of water or alcohol.
Uses.—Astringent; antiseptic. **Dose, 0,125 Gm.**
Adm.—1% aqueous solution as lotion. As intestinal astringent in keratin-coated pills, or in double gelatin capsules.

ZINCI STEARAS. (Zin'-si ste'-ar-as.) **Zinci steara'tis. Zinc stearate.**
A very fine, white powder, tasteless, and having a faint odor, resembling that of fat.
Sol.—Insoluble in water, alcohol, or ether.
Uses.—Protectant.
Prep.—**Unguentum zinci stearatis.**. (50%.)

ZINCI SULPHAS. (Zin'-si sul'-fas.) **Zinci sulpha'tis. Zinc sulphate.** Syn.—White vitriol.

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Sol.—In 0,53 of water; about 3 of glycerin; insoluble in alcohol.

Inc.—See zinci chloridum and acidum sulphuricum.

Uses.—Astringent; emetic. **Dose, 1 Gm.** (as emetic).

Adm.—1-5 to 1 per cent solution as lotion. Internally, solution in aromatic water (e. g., peppermint water), sweetened with flavoring syrup (e.g., syrup of ginger); or in pill with extract of gentian as excipient.

ZINCI VALERAS. (Zin'-si val'-er-as.) **Zinci valera'tis. Zinc valerate.**

White, pearly scales, having the odor of valeric acid, and a sweetish, astringent and metallic taste. On exposure to the air, it slowly loses valeric acid.

Sol.—In about 50 of water; 35 of alcohol.

Inc.—All **acids,** soluble **carbonates, most metallic salts** and **vegetable astringents.**

Uses.—Same as valerian. **Dose, 0,125 Gm.**

Adm.—In pill or capsule with extract of **gentian as** excipient.

ZINCUM. (Zingk'-um.) **Zinci. Zinc.**

The metal is used in preparation of zinc salts.

ZINGIBER. (Zin'-jib-er.) **Zingib'eris. Ginger.** The dried rhizome of *Zingiber officinale.*

Flattish, irregularly branched gray or white pieces; odor aromatic; taste aromatic and pungent.

Comp.—Volatile oil; resin, etc.

Uses.—Stomachic; carminative; flavoring agent. **Dose, 1 Gm.**

Prep.—1. **Oleoresina zingiberis. Dose, 0,03 Gm.**
2. **Fluidextractum zingiberis. Dose, 1 Cc.**
3. **Tinctura zingiberis.** (20%.) **Dose, 2 Cc.**
4. **Syrupus zingiberis.** (3%.) **Dose, 16 Cc.**

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APPENDIX.

Suggestions for Laboratory Exercises.

The student should read the chapter or chapters in relation with the laboratory exercise before coming to the laboratory. It will save valuable time and prevent confusion.

The underscoring, e. g. of "Prepare" or "Problem" is intended to help locating at a glance the work to be done by the student.

When two or more preparations are to be made in one laboratory period, commence with the one that needs most time; and, while maceration, percolation, or filtration of the first one is going on, attend to the second preparation.

The preparations should be put up neatly in appropriate bottles or boxes, until they have been examined by the instructor; or used in subsequent laboratory exercises.

In the subjoined list of drugs, it will be noticed that the laboratory work has been divided into 16 exercises; the teacher may, of course, find it necessary to increase or diminish the number of exercises.

Should time permit, students might profitably prepare many of the preparations needed in the various laboratory exercises. The formulæ for these preparations can be found in the pharmacopœia, a copy of which should be accessible in the laboratory.

LIST OF APPARATUS REQUIRED FOR LABORATORY EXERCISES.

For Groups of Students.

Prescription scale.
Set of metric weights.
Thermometer.
Erlenmeyer flask (100 Cc.).
Hypodermic syringe.

For Each Student.

Metric graduate, 100 Cc.
Measuring pipette.
Beakers, assorted sizes.
Test tubes, a few.
Mortar and pestle, small size.
Funnel, small size.
Spatula.
Glass rod.
Straining cloth.
Absorbent cotton.
Filter paper.
Prescription blanks.

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Small percolator, with U. S. P. fittings.
Plunger (see p. 120).
Small glass plate for covering.
Porcelain evaporating dish.
Water bath.
Watch glass.
Labels for 1-ounce bottles.
1 doz. 1-ounce bottles.
2 only, 4-ounce bottles.
2 only, 1-ounce glass ointment jars.
1 doz. small pill boxes.
¼ doz. small powder boxes.

LIST OF DRUGS REQUIRED FOR LABORATORY EXERCISES.

Distilled water and alcohol for many exercises.

			For each student.
Exercise 1.	Cinnamon water. Page 77.	Oil of cinnamon,	0,06 Cc.
		Purified talc,	0,45 Gm.

Specimens of aromatic waters.

	Solution of ammonium acetate. Page 8.	Ammonium carbonate,	1,50 Gm.
		Diluted acetic acid,	30,00 Cc.

Specimen of solution of magnesium citrate.

Exercise 2.	Syrup of orange flowers. Page 84.	Granulated sugar,	25,50 Gm.
		Orange flower water,	20,00 Cc.

Specimens of flavoring syrups.

	Aromatic spirit of ammonia. Page 92.	Ammonium carbonate,	1,02 Gm.
		Ammonia water,	2,70 Cc.
		Oil of lemon,	0,30 Cc.
		Oil of lavender flowers,	0,03 Cc.
		Oil of nutmeg,	0,03 Cc.

Specimens of flavoring spirits.

Exercise 3.	Aromatic elixir. Page 94.	Compound spirit of orange,	0,36 Cc.
		Syrup,	11,25 Cc.
		Purified talc,	0,90 Gm.
	Glycerite of starch. Page 96.	Starch,	2,00 Gm.
		Glycerin,	16,00 Gm.
Exercise 4.	Chalk mixture. Page 99.	Prepared chalk,	1,80 Gm.
		Powdered acacia,	1,20 Gm.
		Powdered sugar,	3,00 Gm.
	Experiment.	Diluted hydrochloric acid,	2,00 Cc.

Microscope with droplet of milk on slide.

Extra slides for examination of emulsion.

	Emulsion of asafetida. Page 101.	Asafetida,	1,20 Gm.

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Emulsion of cod liver oil. Page 102.	Cod liver oil,	15,00	Cc.
	Powdered acacia,	3,75	Gm.
	Syrup,	3,00	Cc.
	Oil of gaultheria,	0,12	Cc.
Exercise 5. Infusion of digitalis. Page 111.	Digitalis, bruised,	0,45	Gm.
Assay of infusion of digitalis.	Three frogs, scissors, forceps, scalpel.		
Decoction of scoparius. Page 113.	Scoparius, coarse powder,	6,00	Gm.
Exercise 6. Compound tincture of gentian. Page 120.	Gentian, moderately coarse powder,	3,00	Gm.
	Bitter orange peel, coarse powder,	1,20	Gm.
	Cardamom, coarse powder,	0,30	Gm.
	Clean pebble.		
Tincture of opium. Page 121.	Granulated opium,	10,00	Gm.
Exercise 7. Assay of tincture of opium. Page 122.	Ammonia water,	3,50	Cc.
	Ether,	60,00	Cc.
	Lime water,	150,00	Cc.
	Mercuric potassium iodide test solution.		
Exercise 8. Fluid extract of ergot. Page 130.	Ergot, in fine powder,	30,00	Gm.
	Acetic acid,	0,60	Cc.
Exercise 9. Oleoresin of aspidium. Page 133.	Aspidium, in moderately coarse powder,	10,00	Gm.
	Acetone,	60,00	Cc.
	Gelatin capsules.		
Extract of gentian. Page 135.	Gentian, coarse powder,	10,00	Gm.
	Lycopodium.		
Exercise 10. Resin of sammony. Page 136.	Scammony, in fine powder,	5,00	Gm.
Compound effervescing powder. Page 139.	Sodium bicarbonate,	2,58	Gm.
	Potassium and sodium tartrate,	7,75	Gm.
	Tartaric acid,	2,25	Gm.
	Blue powder paper.		
	White powder paper.		
Exercise 11. Calomel powders. Page 142.	Mild mercurous chloride,	0,05	Gm.
	Sugar of milk,	0,80	Gm.
	4 small white powder papers.		
Elaterin powders. Page 144.	Elaterin,	0,012	Gm.
	Extract of hyoscyamus,	0,24	Gm.
	Sugar of milk.		
	4 small white powder papers.		

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Exercise 12. Compound cathartic pills. Page 154.	Compound extract of colocynth,	0,40	Gm.
	Mild mercurous chloride,	0,30	Gm.
	Resin of jalap,	0,10	Gm.
	Gamboge,	0,075	Gm.
	Starch, powdered.		
	Lycopodium.		
Aconite tablets. Page 162.	4 sugar tablets.		
	Tincture of aconite,	0,20	Cc.
Hypodermic injection. Page 163.	5% solution of phenol.		
Exercise 13. Quinine capsules. Page 166.	Quinine sulphate,	1,00	Gm.
	Capsicum, powdered,	0,10	Gm.
	4 empty gelatin capsules No. 1.		
Camphor and hyoscyamus capsules. Page 166.	Camphor,	0,36	Gm.
	Extract of hyoscyamus,	0,18	Gm.
	Extract of sumbul,	0,75	Gm.
	4 empty gelatin capsules.		
Copaiba capsules. Page 166.	Copaiba,	2,00	Cc.
	4 empty gelatin capsules.		
Charcoal cachets. Page 167.	Charcoal,	4,00	Gm.
	4 cachets.		
Exercise 14. Opium and belladonna suppositories. Page 170.	Extract of opium,	0,12	Gm.
	Extract of belladonna leaves,	0,04	Gm.
	Cacao butter,	8,00	Gm.
	Expressed oil of almond.		
	Lycopodium.		
Turpentine liniment. Page 175.	Resin cerate,	19,50	Gm.
	Oil of turpentine,	10,50	Cc.
Exercise 15. Test for rancidity. Page 180.	Rancid fat.		
	Fresh fat.		
	Potassium iodide.		
Iodine ointment. Page 182.	Iodine,	0,60	Gm.
	Potassium iodide,	0,60	Gm.
	Glycerin,	1,80	Gm.
	Benzoinated lard,	12,00	Gm.
Cantharides plaster. Page 185.	Cantharides cerate.		
	Adhesive plaster, 3 x 3 Cm.		
	Soap solution.		
	Waxed paper.		
	Small paper envelope.		
Exercise 16. Linseed poultice. Page 187.	Linseed meal,	100,00	Gm.
	Cotton cloth.		
	Thin muslin.		

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Lead plaster. Page 189.	Lead plaster, Thin leather, 5 x 5 Cm. Waxed paper. Envelope.	5,00 Gm.
One mustard paper. Page 191.		

Experiments on flavoring and disguising. (Which might be introduced in some of the preceding exercises, as opportunity presents itself.)

Experiment 1. Page 42.	Iodoform, Ichthyol, Oil of rose, Oil of bergamot, Oil of bitter almond, Oil of lavender, Balsam of Peru, Vanillin, Coumarin.
Experiment 2. Page 42.	Quinine tannate, Quinine sulphate.
Experiment 3. Page 43.	Potassium iodide, Milk.
Experiment 4. Page 43.	Quinine sulphate. Fluidextract of eriodictyon. Aromatic syrup of eriodictyon.
Experiment 5. Page 44.	Quinine sulphate, Potassium iodide, Adjuvant elixir.

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INDEX.

Abbreviations, xi
rules for, 14
Absorbent cotton, 272
Absorption, conditions influencing, 59
Acacia, 193
mucilage of, 194
syrup of, 194
Aceta, 131
Acetanilide, 194
powder, compound, 194
Acetanilidum, 194
Acetate, ammonium, solution of, 80, 81, 215
iron and ammonium, solution of, 80, 261
lead, 319
morphine, 297
potassium, 321
sodium, 344
zinc, 366
Acetic acid, 196
acid, diluted, 196
acid, glacial, 196
ether, 209
Acetone, 195
Acetonum, 195
Acetphenetidin, 195
Acetphenetidinum, 195
Acetum opii, 132
scillae, 132
Acid, acetic, 196
acetic, diluted, 196
acetic, glacial, 196
ammonium carbonate, 214
arsenous, 222
arsenous, solution of, 81, 222
benzoic, 196
boracic, 197
boric, 197
boric, ointment of, 180, 197
camphoric, 197
carbolic, 313
carbolic, glycerite of, 96
carbolic, ointment of, 182
chromic, 244
citric, 197
citric, saccharated, 147
Acid—continued.
citric, syrup of, 85, 198
gallic, 198
gallotannic, 205
hydriodic, diluted, 198
hydriodic, syrup of, 86, 199
hydrobromic, diluted, 199
hydrochloric, 199
hydrochloric, diluted, 200
hydrocyanic, diluted, 200
hypophosphorous, 200
hypophosphorous, diluted, 200
lactic, 200
nitric, 201
nitric, diluted, 201
nitrohydrochloric, 201
nitrohydrochloric, diluted, 201
nitromuriatic, 201
nitromuriatic, diluted, 201
oleic, 202
phosphoric, 202
phosphoric, diluted, 202
prussic, diluted, 200
pyrogallic, 328
salicylic, 202
stearic, 203
sulphuric, 203
sulphuric, aromatic, 204
sulphuric, diluted, 204
sulphurous, 204
tannic, 205
tannic, glycerite of, 96, 205
tannic, ointment of, 180, 205
tannic, troches of, 159, 205
tartaric, 206
tartaric, saccharated, 147
trichloracetic, 206
Acida, 195
Acids, incompatibles of, 195
nomenclature of, 11
Acidum aceticum, 196
aceticum dilutum, 196
aceticum glaciale, 196
arsenosum, 222
benzoicum, 196
boricum, 197
camphoricum, 197
carbolicum, 313

Digitized by Google

Acidum—continued.
chromicum, 244
citricum, 197
citricum saccharatum, 147
gallicum, 198
hydriodicum dilutum, 198
hydrobromicum dilutum, 199
hydrochloricum, 199
hydrochloricum dilutum, 200
hydrocyanicum dilutum, 200
hypophosphorosum, 200
hypophosphorosum dilutum, 200
lacticum, 200
nitricum, 201
nitricum dilutum, 201
nitrohydrochloricum, 201
nitrohydrochloricum dilutum, 201
oleicum, 202
phosphoricum, 202
phosphoricum dilutum, 202
salicylicum, 202
stearicum, 203
sulphuricum, 203
sulphuricum aromaticum, 204
sulphuricum dilutum, 204
sulphurosum, 204
tannicum, 205
tartaricum, 206
tartaricum saccharatum, 147
trichloraceticum, 206
Aconite, 207
fluidextract of, 127, 207
tincture of, 115, 207
Aconitina, 206
Aconitine, 206
Aconitum, 207
Adeps, 180, 207
benzoinatus, 180, 207
lanae, 208
lanae hydrosus, 179, 208
Adhesive plaster, 188
Adjectives, 11
Adjuvant, 37, 38
Adjuvant elixir, 94
elixir in disguising, 44
Administration, alimentary, 58
endermic, 62
epidermic, 61
for action on intestine, 29, 53
for action on rectum or urethra, 29
for action on stomach, 29, 53
for continued action, 30
for general action, 29, 58
hypodermic, 63
for local action, 47
Administration—continued.
method of, requires modification of dose, 27
mouth and throat, 29
oral, 58
for prompt impression, 29
rectal, 60
subcutaneous, 63
Aether, 208
aceticus, 209
Aethylis carbamas, 209
chloridum, 209
Alcohol, 210
absolute, 210
absolutum, 210
diluted, 210
dilutum, 210
Alcoholic solutions, 89
Aldehyde, cinnamic, 247
Alkaloids, 210
incompatibles of, 211
Alkanet, 41
Allspice, 318
oil of, 318
Almond, bitter, 216
bitter, oil of, 217
bitter, spirit of, 90, 217
bitter, water, 78, 217
emulsion of, 100, 217
milk of (emulsum amygdalae), 100, 217
oil of, expressed, 301
sweet, 217
syrup of, 85, 217
Aloe, 211
purificata, 211
Aloes, 211
and iron, pills of, 152, 211
and mastic, pills of, 152, 211
and myrrh, pills of, 152, 212
and myrrh, tincture of, 117, 212
extract of, 134, 211
pills of, 152, 211
purified, 211
tincture of, 117, 211
Aloin, 212
Aloinum, 212
Althaea, 212
Alum, 212
ammonio-ferric, 262
burnt (alumen exsiccatum), 213
dried, 213
exsiccated, 213
iron ammonium, 262
potassium (alumen), 212
Alumen, 212
exsiccatum, 213

Digitized by Google

Alumen—continued.
ustum (alumen exsiccatum), 213
Alumini hydras, 213
hydroxidum, 213
sulphas, 213
Aluminum and potassium sulphate, 212
hydroxide, 213
sulphate, 213
American wormseed, oil of, 302
Ammonia, incompatibles of, 213
liniment, 174, 214
muriate of (ammonii chloridum), 215
spirit of, 91, 214
spirit of, aromatic, 91, 214
spirit of, aromatic, preparation of, 92
water, 78, 214
water, stronger, 78, 214
Ammoniated glycyrrhizin, 271
mercury, 279
mercury, ointment of, 181, 280
tincture of guaiac, 118
tincture of valerian, 119
Ammonii benzoas, 214
bromidum, 214
carbonas, 214
chloridum, 215
iodidum, 216
salicylas, 216
valeras, 216
valerianas, 216
Ammonio-ferric alum, 262
citrate (ferri et ammonii citras), 262
sulphate, 262
tartrate (ferri et ammonii tartras), 262
Ammonium acetate, solution of, 80, 215
acetate, solution of, preparation, 81
benzoate, 214
bromide, 214
carbamate, 214
carbonate, 214
carbonate, acid, 214
chloride, 215
chloride, troches of, 159, 215
Amygdala amara, 216
dulcis, 217
Amyl nitris, (U. S. P. 1890), 217
nitrite, 217
Amylum, 218
Annatto, 41
Animal charcoal, 239
charcoal, purified, 239
Anise, 218
oil of, 218
spirit of, 90, 218
water, 78, 218
Anisum, 218
Anthemis, 218
Antidiphtheritic serum, 343
Antidote, arsenic, 264
Antifebrin, 194
Antimonii et potassii tartras, 218
Antimony and potassium tartrate, 218
tartrated (antimonii et potassii tartras), 218
wine of, 125, 219
Antipyrina, 219
Antipyrine, 219
Antiseptic solution, 83
Antitoxin, diphtheria, 343
Apocynum, 219
fluidextract of, 127, 219
Apomorphinae hydrochloras, 219
hydrochloridum, 219
Apomorphine hydrochlorate, 219
hydrochloride, 219
Apothecaries' measure, 17
Apothecaries' weight, 17
Appendix, 371
Apple, bitter, 251
Applications to conjunctiva, 48
to larynx, 51
for action upon skin, 47
for mouth, 50
to mucous membrane, 48
to nasal mucous membrane, 49
to parts beneath surface, 57
for pharynx, 50
to rectum, 54
to vagina, 56
Aqua, 77
ammoniae, 78, 214
ammoniae fortior, 78, 214
amygdalae amarae, 78, 217

Digitized by Google

Aqua—continued.
distillata, 76
foeniculi, 78, 266
hamamelidis, 78, 274
hydrogenii dioxide, 78, 220
menthae piperitae, 78, 294
menthae viridis, 78, 295
regia, 201
rosae, 78, 306
rosae fortior, 78, 306
Aquae, 77
Aqueous solutions, 76
Argenti cyanidum, 220
nitras, 220
nitras dilutus, (argenti nitras mitigatus), 221
nitras fusus, 221
nitras mitigatus, 221
oxidum, 221
Aristol, 362
Arnica, 221
tincture of, 117, 221
Aromatic elixir, 94
elixir, preparation of, 94
fluidextract, 127
fluidextract of cascara sagrada, 129
powder, 138
spirit of ammonia, 91, 92
spirit of ammonia, preparation of, 92
sulphuric acid, 204
syrup of rhubarb, 86
tincture of rhubarb, 119
Arsenate of sodium, 345
sodium, exsiccated, 345
sodium, solution of, 82, 345
Arseni iodidum, 221
trioxidum, 222
Arsenic antidote, 264
iodide, 221
trioxide, 222
white (arseni trioxidum), 222
Arsenite, potassium, solution, 81
Arsenous acid, 222
acid, solution of, 81, 222
and mercuric iodides, solution of, 82, 222
anhydride, (arseni trioxidum), 222
iodide, 221
oxide, (arseni trioxidum), 222
Asafetida, 223
emulsion of, 100, 223
emulsion of, preparation, 101
milk of (emulsum asafoetidae), 100, 223
pills of, 152, 223
tincture of, 117, 223
Asafoetida, 223
Ascending dose, 28
Ash, prickly (xanthoxylum), 366
Aspidium, 223
oleoresin of, 133, 223
Assay of digitalis, infusion, 111
opium, tincture, 122
Assaying, 110
Atomization, 53
Atropina, 224
Atropinae sulphas, 224
Atropine, 224
oleate of, 176, 224
sulphate, 224
Aural suppositories, 169
Aurantii amari cortex, 224
dulcis cortex, 225
Auri et sodii chloridum, 225
Average dose, 22
Avoirdupois weight, 17

Balneum, 47, 172
Balsam, Canada, 361
of copaiba, 252
of fir, 361
friar's (tinctura benzoini composita), 117
of Peru, 226
of Tolu, 226
Balsamum peruvianum, 226
tolutanum, 226
Basham's mixture, 82
Basilicon ointment, 184
Basis, 37
Bath, 47, 172
Bearberry, 363
Belladonna leaves, 226
leaves, extract of, 134, 227
leaves, tincture of, 115, 227
liniment, 174, 227
ointment, 181, 227
plaster, 188, 227
root, 227
root, fluidextract of, 127, 227
Belladonnae folia, 226
radix, 227
Benzaldehyde, 227
Benzaldehydum, 227
Benzin, 227
petroleum, 227
petroleum, purified, 228
Benzinum, 227
purificatum, 228
Benzoate, ammonium, 214
lithium, 288
sodium, 345
Benzoic acid, 196
Benzoin, 228
tincture of, 117, 228

Digitized by Google

Benzoin—continued.
tincture, compound, 117, 228
Benzoinated lard, 228
Benzoinum, 228
Benzosulphinide, 43, 228
Benzosulphinidum, 43, 228
Berberis, 228
fluidextract of, 127, 229
Betanaphthol, 229
Betula, oil of, 302
Bicarbonate, potassium, 321
sodium, 345
sodium, troches of, 159, 346
Bichloride of mercury, 276
Bichromate, potassium, 324
Biniodide of mercury, 278
Birch, sweet, oil of, 302
Bismuth ammonio-citrate, 229
and ammonium citrate, 229
Bismuth citrate, 229
subcarbonate, 229
subgallate, 230
subnitrate, 230
subsalicylate, 230
Bismuthi citras, 229
et ammonii citras, 229
subcarbonas, 229
subgallas, 230
subnitras, 230
subsalicylas, 230
Bisulphate, quinine, 330
Bisulphide, carbon, 239
Bisulphite, sodium, 346
Bitartrate, potassium, 322
Blackberry, 334
Bladder, injections, 56
Blank, of prescription, 5
Blaud's pills, 153
Bloodroot, 336
Blue coloring, 41
Bolus, 151
Boneset, 259
Boracic acid, 197
Borate sodium, 346
Borax, 346
Boric acid, 197
ointment of, 180, 197
Boroglycerin, glycerite of, 96, 197
Bougies, 56
Brandy, 91
Brayera, 255
Bromide, ammonium, 214
calcium, 233
lithium, 288
potassium, 322
sodium, 346
strontium, 354
zinc, 366
Bromine, 231
Bromoform, 231
Bromoformum, 231
Bromum, 231
Broom, 340
Brown coloring, 41
mixture, 98
Buchu, 231
fluidextract of, 127, 231
Buckthorn, 267
Burdock root, 286
Butter, cacao, 308

Cacao butter, 308
Cachetae, 167
Cachets, 167
Cade, oil of, 302
Caffeina, 232
citrata, 232
citrata effervescens, 146, 232
Caffeine, 232
citrate, 232
citrated, 232
citrated, effervescent, 146, 232
Cajuput, oil of, 302
Calabar bean, 315
Calamus, 232
fluidextract of, 127, 232
Calcii bromidum, 233
carbonas praecipitatus, 233
chloridum, 233
hypophosphis, 234
phosphas praecipitatus, 234
sulphas exsiccatus, 234
Calcined magnesia, 290
Calcium bromide, 233
carbonate, 233
carbonate, precipitated, 233
chloride, 233
hydroxide, solution of, 80, 235
hydroxide, syrup of, 86, 235
hypophosphite, 234
lactophosphate, syrup of, 86, 234
oxide, 235
oxide, chlorinated, 235
Calcium bromide, 233
phosphate, precipitated, 234
sulphate, dried, 234
sulphate, exsiccated, 234
sulphide, crude, 236
Celendula, 234
tincture of, 118, 235
Calomel, 277
Calumba, 235
fluidextract of, 127, 235
tincture, 118, 235
Calx chlorata, (Phar. 1890), 235
chlorinata, 235
sulphurata, 236

Digitized by Google

Cambogia, 236
Camphor, 236
cerate, 184, 236
liniment, 174, 236
monobromated, 236
spirit of, 90, 236
water, 78, 236
Camphora, 236
monobromata, 237
Camphorated tincture of opium, 119
Camphoric acid, 197
Canada balsam, 361
Canadian hemp, 219
Cane sugar, 335
Cannabis, Indian, 237
Indian, extract of, 134, 238
Indian, fluidextract of, 127, 238
Indian, tincture of, 116, 238
indica, 237
Cantharidal collodion, 177, 238
plaster, preparation of, 185
Cantharides, 238
cerate, 184, 238
tincture of, 116, 238
Cantharis, 238
Capsicum, 238
fluidextract of, 127, 238
oleoresin of, 133, 238
plaster, 188, 238
tincture of, 116, 238
Capsulae, 164
gelatinae, 164
amylaceae, 167
Capsules, 164
gelatin, 164
starch, 167
suppository, 171
Caraway, 240
oil of, 240
Carbamate, ammonium, 214
ethyl, 209
Carbo animalis, 239
animalis purificatus, 239
Carbo ligni, 239
Carbolic acid, glycerite of, 96, 314
acid, ointment of, 182, 314
acid, 313
Carbon bisulphide, 239
disulphide, 239
Carbonate, ammonium, 214
ammonium, acid, 214
calcium, 233
calcium precipitated, 233
ferrous, mass of, 149
ferrous, pills of, 153
ferrous, saccharated, 260
guaiacol, 273
Carbonate—continued.
lithium, 288
magnesium, 290
potassium, 322
sodium, 347
sodium monohydrated, 347
zinc precipitated, 367
Carbonei disulphidum, 239
Cardamom, 239
tincture of, 118, 239
tincture of, compound, 118, 239
Cardamomum, 239
Carlsbad salt, effervescent artificial, 147
Carmine, 41
Carron oil, 174
Carum, 240
Caryophyllus, 240
Casacara sagrada, 332
sagrada, extract of, 135, 333
sagrada, fluidextract of, 129, 333
sagrada, fluidextract of, aromatic, 129, 333
Cassia fistula, 240
oil of, 303
purging, 240
Castile soap, 338
Castor oil, 306
Cataphoresis, 48
Cataplasm of kaolin, 241
Cataplasma kaolini, 241
Catechu, (Phar. 1890), 267
Cathartic pills, compound, 152
pills, vegetable, 152
Caustic, lunar, 220
mitigated, 221
Cayenne pepper, 238
Cera alba, 241
flava, 241
Cerata, 184
list of, 184
Cerate, cantharidal, spreading of, 185
Cerates, 47, 184
list of, 184
Cerii oxalas, 241
Cerium oxalate, 241
Cetaceum, 241
Ceylon cinnamon, 247
Chalk, drop, 254
mercury with, 279
mixture, 98, 254
powder, compound, 138, 254
prepared, 254
Chamomile, 218
English, (anthemis), 218
German, 294
Roman, (anthemis), 218

Digitized by Google

Charcoal, 239
animal, 239
animal, purified, 239
Charta sinapis, 191, 344
Chartæ, 191
Chartulæ, 141
Chemical incompatibility, 44
Chenopodium, oil of, 302
Cherry, wild, 327
wild, fluidextract, 128, 327
wild, infusion, 111, 327
wild, syrup of, 86, 327
Chimaphila, 242
fluidextract of, 127, 242
Chirata, 242
fluidextract of, 127, 242
Chloral, 243
hydrate, (Phar. 1890), 243
Chloralformamide, 242
Chloralformamidum, 242
Chloralum hydratum, 243
Chlorate, potassium, 323
potassium, troches of, 159, 323
sodium, 347
Chloride, ammonium, 215
ammonium, troches of, 159, 215
calcium, 233
ethyl, 209
ferric, 261
ferric, tincture of, 116, 261
gold and sodium, 225
of lime, 235
mercuric, 276
mercuric, corrosive, 276
mercurous, 277
mercurous, mild, 277
sodium, 347
zinc, 367
zinc, solution of, 83, 367
Chlorinated calcium oxide, 235
lime, 235
soda, solution of, 80, 236
Chlorine, compound solution of, 80, 244
water, 80, 244
Chloroform, 243
emulsion of, 100, 243
liniment, 174, 243
spirit of, 91, 243
water, 78, 243
Chloroformum, 243
Choice of ingredients, 36
Chondrus, 244
Chromic anhydride, 244
acid, 244
Chromii trioxidum, 244
Chromium trioxide, 244
Chrysarobin, 245
ointment, 245
Chrysarobinum, 245
Cimicifuga, 245
extract of, 134, 245
fluidextract of, 127, 245
tincture of, 118, 245
Cinchona, 245
fluidextract of, 127, 246
red, 246
rubra, 246
tincture of, 118, 246
tincture of, compound, 118, 246
Cinchonidinæ sulphas, 246
Cinchonidine sulphate, 246
Cinchoninæ sulphas, 246
Cinchonine sulphate, 246
Cineol, 258
Cinnaldehydum, 247
Cinnamic aldehyde, 247
Cinnamomum saigonicum, 247
zeylanicum, 247
Cinnamon, Ceylon, 247
oil of, 303
Saigon, 247
spirit of, 90, 303
tincture of, 117, 247
water, 77, 303
water, preparation of, 77
Citrate, ammonio-ferric, 262
bismuth, 229
bismuth and ammonium, 229
caffeine, 232
ferric, 262
ferric, soluble, (Ferri et ammonii citras), 262
iron and ammonium, 262
iron and quinine, 263
iron and quinine, soluble, 263
iron and strychnine, 263
Citrate, lithium, 288
lithium, effervescent, 146, 289
magnesium, solution of, 81, 290
sodium, 347
Citrated caffeine, 232
caffeine, effervescent, 146, 232
Citric acid, 197
acid, syrup of, 85, 198
acid, in disguising, 44
Citrine ointment, 181
Clarified honey, 87
Cloves, 240
oil of, 240
oil of, synthetic, (Engenol), 259

Digitized by Google

Clysters, 54
Coca, 247
fluidextract of, 127, 248
wine of, 125, 248
Cocaina, 248
Cocainæ hydrochloras, 248
hydrochloridum, 248
Cocaine, 248
hydrochloride, 248
oleate of, 176, 248
Coccus, 249
Cochineal, 249
Codeina, 249
Codeinæ phosphas, 249
sulphas, 250
Codeine, 249
phosphate, 249
sulphate, 250
Cod liver oil, 305
emulsion of, 100, 305
emulsion, preparation of, 102
with hypophosphites, emulsion of, 100, 305
Cohosh, black, 245
Colchici cormus, 250
radix, Pharm. 1890 (colchici cormus), 250
semen, 250
Colchicina, 251
Colchicine, 251
Colchicum corm, 250
corm, extract of, 134, 250
root, (corm), 250
seed, 250
seed, fluidextract of, 127, 250
seed, tincture of, 116, 250
seed, wine of, 125, 250
Collection of drugs, 105
Collodion, 177
blistering, 177
cantharidal, 177
corn, 177
flexible, 177
styptic, 177
Collodium, 177
cantharidatum, 177
flexile, 177
salicylatum compositum, 177
stypticum, 177
Colloids, in disguising, 42
Collyrium, 48, 172
Colocynth, 251
extract of, 134, 251
extract compound, 134, 251
Colocynthis, 251
Colophony, 331
Coloring of medicines, 41
Columbo, 235
Combining tastes, 43
Comminution of drugs, 106
Composition of Prescriptions, 35
Conditions influencing absorption, 59
Confectio rosæ, 150
sennæ, 150
Confection of rose, 150
of senna, 150
Confectiones, 149
Conium, 251
fluidextract of, 127, 252
Conjunctiva, applications to, 48
Convallaria, 252
fluidextract of, 127, 252
Conversion of metric into old system, 21
of old into metric system, 21
Copaiba, 252
balsam of, 252
oil of, 253
Copaiva, 252
Copper sulphate, 255
Coriander, 253
oil of, 253
Coriandrum, 253
Corm, colchicum, 250
Corn silk, 366
starch, (amylum), 218
Corrective, 37, 39
Corrosive mercuric chloride, 276
sublimate, 276
Cost of prescriptions, 71
Cotton, absorbent, 272
gun, soluble, 328
purified, 272
Cotton, root bark, 271
seed oil, 304
Couch-grass, 363
Cowling's rule, 24
Cramp-bark, 365
Cranesbill, 269
Cream of tartar, 322
Creosote, 253
water, 78, 254
Creosotum, 253
Cresol, 254
compound solution, 83, 254
Creta praeparata, 254
Crocus, 41
Crossed action, 38
Croton oil, 308
Cubeb, 254
fluidextract of, 127
oil of, 255
oleoresin of, 133, 255
troches of, 159, 255
Cubeba, 254
Cubic centimeter, 19
Cudbear, tincture of, 19

Digitized by Google

Culver's root, 286
Cupri sulphas, 255
Cusso, 255
Cyanide, potassium, 324
silver, 220
Cypripedium, 256
fluidextract of, 127, 256

Dandelion, 360
Date of prescription, 6
Decimal point, 20
Decocta, 112
Decoction, 108
Decoctions, 112
Definitions, 1
Desiccation of drugs, 105
Determination of dose of the finished product, 27
Determination of number of doses, 30
Determination of Quantities, 16
Deodorized opium, 309
opium, tincture of, 116, 310
Desiccated suprarenal glands, 239
thyroid glands, 270
Diachylon ointment, 181
plaster, 189
Dichromate, potassium, 324
Digestion, 107
Digitalis, 256
extract of, 134, 256
fluidextract of, 127, 256
infusion of, 111, 256
preparation of, 111
assay of, 111
tincture of, 116, 256
Dioxide, hydrogen, solution of, 78, 220
manganese, precipitated, 292
Diphtheria antitoxin, 343
Directions to patient, 45
to pharmacist, 45
Directive, 39
Discs, gelatin for eye, 49
Disguising disagreeable odors, 42
Disguising taste, 42
Dispensatory defined, 3
Displacement, 108
Distilled water, 76
Disulphide, carbon, 239
Dithymol-diiodide, 362
Domestic measures, 22
Donovan's solution, 82
Dosage, 22
Dose modification for aged, 24
Dose modification for children, 24
Dose hypodermic, 63
Douches, 56
Dover's powder, 139
powder, fluid, (tinctura ipe cacuanhæ et opii), 116
Draught, black, 111
Drop chalk, 254
Drug, defined, 1
Dusting powders, 191

Effervescing powder, compound, 139
powders, 145
Elastica, 257
Elaterin, 257
trituration of, 144, 257
Elaterinum, 257
Eleosacchara, 145
Elixires, 93
list of, 94
Elixirs, 93
list of, 94
Elm, 363
mucilage of, 88
slippery, 363
Embrocations, 174
Emetic, tartar, 218
Emplastra, 188
list of, 188, 189
Emulsa, 99
list of, 100
Emulsion of asafetida, preparation of, 101
of cod liver oil, preparation of, 102
Emulsions, 99
list of, 100
English, official name, 10
English in prescriptions, 7
Endermic administration, 62
Enemata, 54, 55, 172
Enteric pills, 155
Epidermic administration, 61
Epsom salt, 291
Equivalents of domestic measures, 22
Equivalents of metric and old systems, 21
Ergot, 257
extract of, 134, 258
fluidextract of, 127, 258
wine of, 125, 258
of rye, 257
Ergatol, 257
Erigeron, oil of, 303
Eriodictyon, 43, 258
fluidextract of, 43, 127, 258
Errors of transposition, 35
Erythroxylon, 247
Eserine salicylate, 315
sulphate, 316

Digitized by Google

Ether, 208
acetic, 209
nitrous, spirit of, 91, 352
spirit of, 91, 208
spirit of compound, 91, 208
sulphuric, 208
Ethereal oil, 209
Ethics of prescribing, 67
Ethyl acetate, 209
carbamate, 209
chloride, 209
Eucalyptol, 258
Eucalyptus, 258
fluidextract of, 128, 259
oil of, 259
Eugenol, 259
Euonymus, 259
Euonymus, extract of, 134, 259
fluidextract of, 128, 259
Eupatorium, 259
fluidextract of, 128, 260
Excipient, 156
Experiments, 1 to 5, 42, 43, 44
Expressed oil of almond, 301
Extemporaneous, 140
Extract of gentian, preparation of, 135
Extracta, 133
list of, 134
Extraction, 106
Extracts, 133
list of, 134

Fel bovis, 260
bovis purificatum, 260
Fennel, 266
oil of, 266
water, 78, 266
Fern, male, 223
Ferri carbonas saccharatus, 260
chloridum, 261
citras, 262
et ammonii citras, 262
et ammonii sulphas, 262
et ammonii tartras, 262
et potassii tartras, 263
et quininæ citras, 263
et quininæ citras solubilis, 263
et strychninæ citras, 263
hydroxidum, 263
hydroxidium cum magnesii oxido, 264
hypophosphis, 264
phosphas solubilis, 264
pyrophosphas solubilis, 265
subsulphas, 265
sulphas, 265
sulphas exsiccatus, 265
Ferri—continued.
sulphas granulatus, 265
tersulphas, 265
Ferric ammonium sulphate, 262
chloride, 261
chloride, solution of, 82, 261
chloride, tincture of, 116, 261
citrate, 262
citrate, soluble, (ferri et ammonii citras), 262
hydrate, (ferri hydroxidum), 263
hydrate with magnesium oxide, 264
hydroxide, 263
hydroxide with magnesium oxide, 264
hypophosphite, 264
phosphate, soluble, 264
pyrophosphate soluble, 265
subsulphate, solution, 82, 265
sulphate, solution of, 82, 265
sulphate, basic, solution of, 82, 265
Ferrocyanide, potassium, 325
Ferrous carbonate, mass of, 149
carbonate, pills of, 153
carbonate, saccharated, 260
iodide, pills of, 153, 264
iodide, syrup of, 86, 264
sulphate, 265
sulphate, dried, 265
sulphate, exsiccated, 265
sulphate, granulated, 265
Ferrum, 265
reductum, 266
Ficus, 266
Fig, 266
Fir, balsam, 361
Flag, sweet, 232
Flavoring of medicines, 42
Flavoring syrups, 85
Flaxseed, 287
oil of, 287
poultice, preparation of, 187
Fleabane, oil of, 303
Flies, blistering, 238
Spanish, 238
Flowers of sulphur, 358
Fluidextracta, 126
list of, 127
Fluidextracts, 126
list of, 127
Foeniculum, 266
Form and language of prescriptions, 5
Formaldehyde, 266
solution of, 83, 266
Forms of medicines, 73

Digitized by Google

Fowler's solution, 82
Foxglove, 256
Frangula, 267
fluidextract of, 128, 267
Frequency of administration, 29
Fresh herbs, tinctures of, 119
Fumigation, 62

Galla, 267
Gallic acid, 198
Gallotannic acid, 205
Gambir, 267
compound tincture of, 118, 268
troches of, 159, 268
Gamboge, 236
Gargarisma, 172
Gargles, 50
Gaultheria, oil of, 303
oil of, synthetic, 295
spirit of, 90
Gelatin, 268
coating, 154
glycerinatum, 268
Gelsemium, 268
fluidextract of, 128, 268
tincture of, 116, 268
Gender of Latin words, 11
Genitive case, 8
case, rules on, 12
precedes, 10
Gentian, 268
extract of, 135, 268
fluidextract of, 128, 268
tincture compound, 118, 268
Gentiana, 268
Geranium, 269
fluidextract of, 128, 269
Ginger, 369
fluidextract of, 130, 369
oleoresin of, 133, 369
syrup of, 86, 369
tincture of, 117, 369
Glands, suprarenal, desiccated, 269
thyroid, desiccated, 270
Glandulæ suprarenales siccæ, 269
thyroideæ siccæ, 270
Glauber's salt, 350
Glonoin, spirit of, 353
Glusidum, 228
Glycerin, 270
solutions, 95
suppositories of, 169, 270
Glycerinated gelatin, 268
Glycerinum, 270
Glycerita, 95
list of, 96
Glycerite of starch, preparation of, 96
Glycerites, 95
list of, 96
Glycerol, 270
Glyceryl trinitrate, spirit of, 353
Glycyrrhiza, 43, 270
and opium, troches, 159, 270
compound mixture of, 98, 270
compound powder of, 139, 270
extract of, 135, 270
extract of pure, 135, 270
fluidextract of, 128, 270
Glycyrrhizin, ammoniated, 270
Glycyrrhizinum ammoniatum, 270
Goa powder, 245
Gold and sodium chloride, 225
coating, 155
Golden seal, 280
Gossypii cortex, 271
radicis cortex, 271
Gossypium purificatum, 272
Goulard's cerate, 184
extract, 82
Grammatical construction of prescription, 7
Granatum, 272
Granules, 151
Grey powder, 279
Griffith's mixture, 98
Grindelia, 272
fluidextract of, 128, 272
Guaiac, 273
resin, 273
tincture of, 118, 273
tincture, ammoniated, 118, 273
Guaiaci resina, (Pharm. 1890), 273
Guaiacol, 273
carbonate, 273
Guaiacolis carbonas, 273
Guaiacum, 273
Guarana, 273
fluidextract of, 128, 274
Gum arabic, 193
Gun cotton, soluble, 328

Habituation to drugs, 25
Hæmatoxylon, 274
Hamamelidis cortex, 274
folia, 274
Hamamelis bark, 274
leaves, 274
leaves, fluidextract, 128, 275
water, 78, 275
Haw, black, 365
Hedeoma, 275
oil of, 275
Hematoxylon, 274
extract of, 135, 274

Digitized by Google

Hemlock, poison, (conium), 251
Hemp, Canadian, 219
Indian, 237
Henbane, 282
Herbs, fresh, tinctures of, 119
Hexamethylenamina, 275
Hexamethylenamine, 275
Hive syrup, 87
Hoarhound, Horehound, 293
Homatropinæ hydrobromidum, 275
Homatropine hydrobromide, 275
Honeys, list of, 87
Hops, 276
How much to prescribe, 30
Humulus, 276
Hydrargyri chloridum corrosivum, 276
chloridum mite, 277
iodidum flavum, 277
iodidum rubrum, 278
oxidum flavum, 278
oxidum rubrum, 278
Hydrargyrum, 279
ammoniatum, 279
cum creta, 279
Hydrastina, 280
Hydrastine, 280
Hydrastininæ hydrochloras, 280
hydrochloridum, 280
Hydrastinine hydrochloride, 280
Hydrastis, 280
fluidextract of, 128, 281
glycerite of, 96, 281
tincture of, 118, 281
Hydrate, chloral, 243
terpin, 361
see hydroxide
Hydrated chloral, 243
oxide of iron, 263
Hydriodic acid, diluted, 198
acid, syrup of, 86, 199
Hydrobromate, see hydrobromide
Hydrobromic acid, diluted, 199
Hydrobromide, homatropine, 275
hyoscine, 281
hyoscyamine, 281
quinine, 330
scopolamine, 341
Hydrochlorate, see hydrochloride
Hydrochloric acid, 199
acid, diluted, 200
Hydrochloride apomorphine, 219
cocaine, 248
hydrastinine, 280
methylthionine, 296
morphine, 297
pilocarpine, 316
quinine, 330
Hydrocyanic acid, diluted, 200
Hydrogen dioxide, solution of, 78, 220
iron by, 266
peroxide, solution of, 78, 220
Hydroxide, aluminum, 213
calcium, solution of, 80, 235
calcium, syrup of, 86, 235
ferric, 263
ferric, with magnesium oxide, 264
potassium, 325
potassium, solution, 80, 325
sodium, 348
sodium, solution of, 80, 348
Hyoscinæ hydrobromas, 281
hydrobromidum, 281
Hyoscine hydrobromide, 281
Hyoscyaminæ hydrobromas, (Pharm. 1890), 281
hydrobromidum, 281
sulphas, 281
Hyoscyamine hydrobromide, 281
sulphate, 281
Hyoscyamus, 282
extract of, 135, 282
fluidextract of, 128, 282
tincture of, 116, 282
Hypodermic administration, 63
dose, 63
injection, 163
solution, 63, 64
Hypodermoclysis, 65
Hypophosphite, calcium, 234
ferric, 264
manganese, 292
potassium, 325
sodium, 348
syrup of, 86
syrup of, compound, 86
Hypophosphorous acid, 200
acid diluted, 200
Hyposulphite, sodium, 351

Ichthyol, disguising, 42
Incompatibility, 44
Idiosyncrasies, 25
Indian cannabis, 237
cannabis, extract of, 134, 238
cannabis, fluidextract, 127, 238
cannabis, tincture of, 116, 238
hemp, 237
Indigo, 41
Ingredients, choice of, 36
Infiltration anæsthesia, 62
Infusa, 110
list of, 111
Infusion, 108

Digitized by Google

Infusion of digitalis, 111
of digitalis, preparation, 111
of digitalis, assay of, 111
Infusions, 110
list of, 111
Inhalation, 51, 61
Injection, 49
bladder, 50
hypodermic, 163
intraseral, 58
intraspinal, 58
intravenous, 65
parenchymatous, 57
subarachnoid, 58
urethral, 55
Inscription, defined, 6
Insufflation, 49
Intestine, administration for action on, 53
Intraseral injection, 58
Intraspinal injection, 58
Intravenous injections, 65
Inunction, 61
Iodide, ammonium, 216
arsenic, 221
arsenous, 221
ferrous, pills of, 153, 264
ferrous, syrup of, 86, 264
lead, 320
mercurous, 277
mercuric, 278
mercury, green, 277
mercury, red, 278
mercury, yellow, 277
potassium, 326
potassium, ointment, 182, 326
Iodide sodium, 348
strontium, 355
sulphur, 359
thymol, 362
zinc, 367
Iodine, 283
compound solution of, 80, 283
ointment, 181, 283
tincture of, 116, 283
Iodoform, 282
ointment, 182
Iodoformum, 282
Iodoformum, experiment to disguise odor of, 42
Iodol, 283
Iodolum, 283
Iodum, 283
Ipecac, 284
Ipecacuanha, 284
Irrigation, 49
Irish moss, 244
Iron, see ferric and ferrous
by hydrogen, 266
metallic, 265
mixture, compound, 98
Quevenne's, 266
reduced, 266
wine of, 125
wine of, bitter, 125

Jaborandi, 317
Jalap, 284
compound powder of, 139, 284
resin of, 136, 284
Jalapa, 284
Joint action, combination for, 38
Juniper, oil of, 304
spirit of, compound, 91, 304
tar, oil of, 302

Kaolin, 285
cataplasm of, 186, 285
Kaolinum, 285
Key to pronunciation, xii
Kino, 285
tincture of, 119, 285
Kissingen salt, artificial effervescent, 147
Kusso, 255
Krameria, 285
extract of, 135, 285
fluidextract of, 128, 285
syrup of, 86, 285
tincture of, 119, 285
troches of, 159, 285

Labarraque's solution, 80
Lactic acid, 200
Lactophosphate, calcium, syrup, 86
Lactucarium, 286
syrup of, 86, 286
tincture of, 117, 286
Lady Webster pills, (Pilulæ aloes et mastiches), 152
Lady's slipper, 256
Lampblack, 41
Language of prescriptions, 5
Lappa, 286
fluidextract of, 128, 286
Lard, 180, 207
benzoinated, 180, 207
oil, 208

Digitized by Google

Laudanum, 116
Sydenham's, 125
Lavements, 54
Lavender, compound tincture of, 117, 304
flowers, oil of, 304
spirit of, 91, 304
Laxative pills, compound, 153
Lead acetate, 319
iodide, 320
nitrate, 320
oxide, 320
plaster, 189
subacetate, cerate of, 184
subacetate, solution of, 82
subacetate, solution of, diluted, 82
sugar of, 319
water, 82
Legible handwriting in prescriptions, 5
Lemon juice, 287
oil of, 287
peel, 287
peel, tincture of, 119, 287
Leptandra, 286
Leptandra, extract of, 135, 287
fluidextract of, 128, 287
Levant wormseed, 337
Licorice powder, compound, 139, 271
root, 270
Light magnesia, 290
Lily-of-the-Valley, 252
Lime, 235
chloride of, 235
liniment, 174, 235
chlorinated, 235
sulphurated, 236
syrup of, 86, 235
water, 80, 235
Limonis cortex, 287
succus, 287
Liniment, turpentine, preparation of, 175
Linimenta, 174
list of, 174
Liniments, 47, 174
list of, 174
Linseed, 287
oil, 287
poultice, preparation of, 187
Linum, 287
Liquor acidi arsenosi, 82
ammonii acetatis, 80
antisepticus, 83
arseni et hydrargyri iodidi, 82
Liquor—continued.
calcis, 80
carmini, 41
chlori compositus, 80
cresolis compositus, 83
ferri chloridi, 82
ferri et ammonii acetatis, 82
ferri subsulphatis, 82
ferri tersulphatis, 82
formaldehydi, 83
hydrargyri nitratis, 82
iodi compositus, 80
magnesii citratis, 80, 81
plumbi subacetatis, 82
plumbi subacetatis dilutus, 82
potassæ, (Pharm. 1890), 80
potassii arsenitis, 82
potassii citratis, 81
potassii hydroxidi, 80
sodæ, 80
sodæ chloratæ, 80
sodæ chlorinatæ, 80
sodii arsenatis, 82
Liquor sodii hydroxidi, 80
sodii phosphatis compositus, 81
zinci chloridi, 83
Liquores, 79
Litharge, 320
Lithii benzoas, 288
bromidum, 288
carbonas, 288
citras, 288
citras effervescens, 146, 289
salicylas, 289
Lobelia, 289
fluidextract of, 128, 289
tincture of, 116, 289
Local action, administration for, 29, 47
Logwood, 274
Lotio, 47
Lotio, flava, 173
nigra, 173
plumbi et opii, 173
Lotiones, 172
Lotions, 172
prescribing of, 173
Lozenges, 50, 158
Lugol's solution, 80
Lunar caustic, 220
Lupulin, 290
fluidextract of, 128, 290
oleoresin of, 133, 290
Lupulinum, 290
Lycopodium, 290

Maceration, 107

Digitized by Google

Magnesii carbonas, 290
oxidum, 290
oxidum ponderosum, 291
sulphas, 291
sulphas effervescens, 146, 291
Magnesium carbonate, 290
citrate, solution of, 80, 81
oxide, 290
oxide, ferric hydroxide with, 264
oxide heavy, 291
sulphate, 291
sulphate effervescent, 146, 291
Male fern, 223
Malt, 291
extract of, 135, 292
Maltum, 291
Mandrake, 320
Manganese dioxide, precipitated, 292
hypophosphite, 292
sulphate, 292
Manna, 292
Marigold, 234
Marrubium, 293
Marshmallow, 212
Mass, blue, 149, 279
of ferrous carbonate, 149
of mercury, 149, 279
Vallet's, 149
Massa ferri carbonatis, 149
hydrargyri, 149, 279
Massæ, 149
Masses, 149
Mastic, 293
Mastiche, 293
Materia medica, defined, 3
Matico, 293
fluidextract of, 128, 294
Matricaria, 294
May apple root, 320
Measures and weights, 17
domestic, 22
Measuring and weighing, 16
Medicated waters, 77
Medicine, defined, 1
Medicines, prices of, 73
names of, 10
Mel, 87
depuratum, 87
rosæ, 87
Mellita, 87
Mentha piperita, 294
Mentha viridis, 295
Menthol, 295
Mercurial ointment, 181, 279
plaster, 188, 279
Mercuric chloride, corrosive, 276
chloride, 276
iodide, 278
iodide, red, 278
nitrate, ointment of, 181, 278
nitrate, solution of, 82, 278
oxide, red, 279
oxide, red, ointment, 181, 279
oxide, yellow, 278
oxide yellow, ointment of, 181, 278
Mercury, ammoniated, 279
ammoniated, ointment of, 181, 280
bichloride of, 276
biniodide of, 278
iodide of, green, 277
iodide of, red, 278
iodide of, yellow, 277
mass of, 149, 279
oleate of, 176, 278
protiodide of, 277
protochloride of, 277
subchloride of, 277
with chalk, 279
Method of administration modifying dose, 27
of writing prescription, 35
Methods of administration, 46
Methylene blue, 41, 296
Methylis salicylas, 295
Methylthioninæ hydrochloridum, 41, 296
Methylthionine hydrochloride, 41, 296
Metric prescription writing, 20
Mezereum, 128, 296
fluidextract of, 296
Mild mercurous chloride, 277
Milk of almond, (emulsum amygdalæ), 100
of asafetida, (emulsum asafetidæ), 100
sugar of, 336
in disguising, 43
Mindererus, spirit of, 80
Mistura cretæ, 98
cretæ, preparation of, 99
ferri composita, 98
glycyrrhizæ composita, 98
rhei et sodæ, 98
Misturæ, 97
Mitigated caustic, 221
silver nitrate, 221
Mixtures, 97
list of, 98
Modification of dose for aged, 24
of dose for children, 24
Monobromated camphor, 237

Digitized by Google

Monohydrated sodium carbonate, 347
Monsel's solution, 82
Morphina, 297
Morphinæ acetas, 297
hydrochloras, 297
hydrochloridum, 297
sulphas, 298
Morphine, 297
acetate, 297
compound powder of, 139, 298
hydrochloride, 297
sulphate, 298
Moschus, 298
Moss, Irish, 244
Mouth, applications for, 50
Mucilages, 88
list of, 88
Mucilagines, 88
in disguising, 42
Mucous membranes, applications to, 48
Muriate of ammonia, 215
Muriate of ammonium, 215
Musk, 298
tincture of, 119, 298
Musk-root, 359
Mustard, black, 344
oil of, volatile, 344
paper, 191, 344
white, 344
Myristica, 299
oil of, 299
Myrrh, 299
tincture of, 117, 299
Myrrha, 299

Names, official, 10
of pharmaceutic preparations, 10
Naphthalene, 299
Naphthalenum, 299
Naphthalin, 299
Naphthalinum, 299
Naphthol, 229
Nasal applications, 49
National formulary, 3
Nebula, 53
Nebulization, 53
Neutral mixture, (liquor potassii citratis), 81
Neutral mixtures, 81
Nitre, 326
sweet spirit of, 352
Nitric acid, 201
acid diluted, 201
Nitrite amyl, 217
sodium, 348
Nitroglycerin, spirit of, 91, 353
Nitrohydrochloric acid, 201
acid diluted, 201
Nitromuriatic acid, 201
acid diluted, 201
Nitrous ether, spirit of, 91, 352
Nomenclature of acids, 11
of proximate principles, 12
pharmacopœial, 10
of salts, 11
Number of doses in a day, 30
Nutgall, 267
ointment, 181, 267
tincture of, 118, 267
Nutmeg, 299
oil of, 299
Nux vomica, 300
extract of, 135, 300
fluidextract of, 128, 300
tincture of, 116, 300

Oak white, 329
Octarius, 18
Official, defined, 2, 3
names, 10
Oil of allspice, 318
of almond, expressed, 301
of American wormseed, 302
of anise, 218
of betula, 302
of bitter almond, 217
of cade, 302
of cajuput, 302
of caraway, 240
Carron, 174
of cassia, 303
castor oil, 306
of chenopodium, 302
of cinnamon, 303
of cloves, 240
of cloves, synthetic, (eugenol), 259
cod liver, 305
cod liver, emulsion of, 100, 102, 305
cod liver, with hypophosphites, emulsion of, 100, 305
of copaiba, 253
of coriander, 253
cotton seed, 304
croton, 308
of cubeb, 255
of erigeron, 303
ethereal, 209
of eucalyptus, 259
of fennel, 266
of flaxseed, 287
of fleabane, 303
of gaultheria, 303

Digitized by Google

Oil—continued.
of hedeoma, 275
of juniper, 304
of juniper tar, 302
lard, 208
of lavender flowers, 304
of lemon, 287
linseed, 287
of mustard, volatile, 344
of myristica, 299
of nutmeg, 299
olive, 305
of orange peel, 225
of pennyroyal, 275
of peppermint, 294
of pimenta, 318
of rose, 306
of rosemary, 306
of sandalwood, 307
of santal, 307
of sassafras, 339
of sassafras, synthetic, (safrol), 336
of savin, 335
of spearmint, 295
of sweet birch, 302
of tar, 319
of theobroma, 308
of thyme, 308
of turpentine, 307
of turpentine, emulsion, 307
of turpentine, rectified, 307
of wintergreen, 303
of wintergreen, synthetic, 295
Oil sugars, 145
Ointment, iodine, preparation of, 182
Ointments, 47, 179
list of, 180
application to rectum, 55
application to urethra, 56
Olea fixa, solubility and incompatibilities of, 300
Olea, volatilia, solubility and incompatibilties of, 301
Oleata, 176
list of, 176
Oleates, 176
list of, 176
Oleic acid, 202
Oleoresin of aconitum, preparation of, 182
Oleum adipis, 208
æthereum, 209
amygdalæ amaræ, 217
amygdalæ expressum, 301
anisi, 218
aurantii corticis, 225
betulæ, 302
cadinum, 302
cajuputi, 302
cari, 240
caryophylli, 240
chenopodii, 302
cinnamomi, 303
copaibæ, 253
coriandri, 253
cubebæ, 255
erigerontis, 303
eucalypti, 259
foeniculi, 266
gaultheriæ, 303
gossypii seminis, 304
hedeomæ, 275
jecoris aselli (oleum morrhuæ), 305
juniperi, 304
lavandulæ florum, 304
limonis, 287
lini, 287
menthæ piperitæ, 294
menthæ viridis, 295
morrhuæ, 305
myristicæ, 299
olivæ, 305
picis liquidæ, 319
pimentæ, 318
ricini, 306
rosæ, 306
rosmarini, 306
sabinæ, 335
sassafras, 339
sinapis volatile, 344
terebinthinæ, 307
terebinthinæ rectificatum, 307
theobromatis, 308
thymi, 308
tiglii, 308
Old systems of weights and measures, 17
Olive oil, 305
Opii pulvis, 309
Opium, 309
camphorated tincture, 119, 310

Digitized by Google

Opium—continued.
plaster, 189, 310
powdered, 309
tincture of, 116, 310
vinegar of, 132, 310
wine of, 125, 310
Oral administration, 58
Orange, syrup of, 85
flower water, 78
flower water, stronger, 78
flower water triple, 78
flowers, syrup of, 85
peel, bitter, 224
peel, bitter, fluidextract of, 127, 225
peel, bitter, tincture, 118, 225
peel, oil of, 225
peel, sweet, 225
peel, sweet, tincture, 118, 225
spirit of, compound, 90, 225
Oregon grape root (berberis), 228
Ounce, 17
Ownership of prescription, 70
Oxalate cerium, 241
Oxgall, 260
purified, 260
Oxide, arsenous, 222
calcium, 235
calcium chlorinated, 235
of iron, hydrated, 263
lead, 320
magnesium, ferric hydroxide, with, 264
magnesium, 290
magnesium, heavy, 291
mercuric, red, 279
mercuric red, ointment of, 181, 279
mercuric, yellow, 278
mercuric yellow, ointment of, 181
silver, 221
zinc, 368
zinc ointment, 182, 368

Palmetto, saw, 335
Pancreatin, 310
Pancreatinum, 310
Paper, mustard, 191
Papers, powder, 141
Parraffin, 311
Paraffinum, 311
Paraldehyde, 311
Paraldehydum, 311
Parenchymatous injections, 57
Parvules, 151
Pastæ, 186
Pastes, 186
Patents on medicines, 70
Pelletierinæ tannas, 311
Pelletierine tannate, 311
Pennyroyal, American, 275
Pepo, 312
Pepper, 318
black, 318
cayenne, 238
oleoresin of, 133, 318
Peppermint, 294
oil of, 295
spirit of, 91, 295
water, 78, 295
Pepsin, 312
Pepsinum, 312
Perchloride, iron, 261
Percolation, 108, 120
Permanganate, potassium, 326
Peroxide, hydrogen solution of, 78, 220
Persio, 41
Peru, balsam of, 226
Peruvian bark, 245
Pessaries, 57, 169
Pessarium, pessum, 169
Petrolatum, 179, 312
album, 313
liquid, 313
liquidum, 313
white, 313
Petroleum benzin, 227
benzin, purified, 227
ointment, (petrolatum), 312
Pharmaceutic incompatibility, 44
Pharmacologic testing, 110
Pharmacology, defined, 3
Pharmacopœia, defined, 2
Pharmacopœia of United States, 2
Pharmacopœial nomenclature, 10
Pharmacy, defined, 1
Pharynx, applications for, 50
Phenacetin, 195
Phenol, 313
glycerite of, 96, 314
liquefactum, 314
liquefied, 314
ointment of, 182, 314
Phenolsulphonate sodium, 349
zinc, 368
Phenyl salicylate, 314
Phenylis salicylas, 314
Phosphate calcium, 234

Digitized by Google

Phosphate—continued.
sodium, compound solution of, 81, 350
sodium exsiccated, 350
Phosphates, iron, quinine and strychnine, elixir of, 94
of iron, quinine and strychnine, glycerite of, 96
of iron, quinine and strychnine, syrup of, 86
Phosphoric acid, 202
acid diluted, 202
Phosphorus, 314
pills of, 153, 314
Physiologic dose, 23
Physostigma, 315
extract of, 135, 315
tincture, 116, 315
Physostigminæ salicylas, 315
sulphas, 316
Physostigmine salicylate, 315
sulphate, 316
Phytolacca, 316
fluidextract of, 128, 316
Pigmenta, 178
Pigments, 51, 178
Pill coating, 154
Pills, 151
compound cathartic, preparation of, 154
enteric, 155
list of, 152
prescribing of, 156
Pilocarpinae hydrochloras, 316
hydrochloridum, 316
nitras, 317
Pilocarpine hydrochloride, 316
nitrate, 317
Pilocarpus, 317
fluidextract of, 128, 317
Pilulæ, 151
catharticæ compositæ, preparation of, 154
entericæ, 155
list of, 152
Pimenta, 318
oil of, 318
Pinkroot, 352
Pint, 18
Piper, 318
Piperina, 318
Piperine, 318
Pipsissewa, 242
Pith sassafras, 339
sassafras mucilage of, 88
Plasters, 188
list of, 188
Pleasant medication, 40.
Plumbi acetas, 319
iodidum, 320
nitras, 320
oxidum, 320
Podophyllin, 321
Podophyllum, 320
belladonna and capsicum, pills of, 153, 321
fluidextract of, 128, 321
resin of, 136, 320
Poke root, 316
Polypharmacy, 37
Pomegranate, 272
fluidextract of, 128, 272
Poor patients, prescribing for, 72
Potash, caustic, 325
Potassa, (Pharm. 1890), 325
Potassii hydroxidum, 325
solution of, 80, 325
Potassii acetas, 321
bicarbonas, 321
bichromas, 324
bitartras, 322
bromidum, 322
carbonas, 322
chloras, 323
citras, 323
citras effervescens, 146, 326
cyanidum, 324
dichromas, 324
et sodii tartras, 324
ferrocyanidum, 325
hydroxidum, 325
hypophosphis, 325
iodidum, 326
nitras, 326
permanganas, 326
sulphas, 327
Potassio-ferric tartrate, 263
Potassium acetate, 321
alum, 212
and sodium tartrate, 324
arsenite, solution of, 81
bicarbonate, 321
bichromate, 324
bitartrate, 322
bromide, 322
carbonate, 322
chlorate, 323
chlorate, troches of, 159, 323
citrate, 323
citrate effervescent, 146, 323

Digitized by Google

Potassium—continued.
hydroxide, 325
hydroxide, solution of, 325
hypophosphite, 325
iodide, 326
iodide, disguising of, 43, 44
iodide, ointment of, 182, 326
nitrate, 326
permanganate, 326
sulphate, 327
Poultice, linseed, preparation of, 187
Poultices, 185
Powder, compound effervescing, preparation of, 139
Powders, 138
dusting, 191
effervescent, 145
in bulk, 141
in cachets, 167
in capsules, 166
in papers, 141
list of, 138, 147
preparation of, 142
prescribing of, 140
Practice in prescription-writing, see problems
Precipitate, red, 279
red, ointment, 181, 279
white, 279
Preface, iii
Preparation of vegetable drugs, 104
Preparations, external, 172
extractive, 104
non-extractive, 73
solid internal, 137
Prescription blank, 5, 68
date of, 6
defined, 1
English in, 7
ethics, 67
grammatical construction, 7
language of, 5
Latin in, 7
parts of, 6
Prescriptions, composition of, 35
cost of, 71
ownership of, 70
repeating of, 69
specifying in, 67
Prescription-writing in metric system, 20
in pen and ink, 5
legible, 5
practice in, see problems
Principles, proximate, nomenclature of, 12
Problems 1 to 5—28
6, 7—31
8 to 14—33, 34
15, 16—38
17, 18, 19—39
20—40
21 to 23—53
24 to 26—55
27 to 29—79
30 to 32—83
33 to 35—87, 88
36—89
37 to 39—93
40 to 42—94
43 to 45—97
46 to 48—99
49 to 51—103, 104
52 to 54—114
55 to 57—124
58—126
59 to 61—131
62—133
63—135
64—136
65 to 70—143
71—144
72—145
73, 74—148
75—149
76—151
77 to 80—158
81—160
82 to 84—162, 163
35 to 88—168
89 to 93—171
94 to 97—173, 174
98, 99—176
100, 101—178
102 to 104—178
105 to 110—183
111 to 112—185
113—187
114—188
115—190
116—191
117 to 120—192
Pronunciation, Key to, xii
rules for, 15
Proprietary medicines, 68
Protiodide of mercury, 277
Protochloride of mercury, 277
Proximate principles, nomenclature of, 12
Prune, 327

Digitized by Google

Pulveres, 138
adspersoria, 191
list of, 138
effervescentes, 145
effervescentes, list of, 146
Pulverization, 53
Purging cassia, 240
Pyrethrum, 328
tincture of, 117, 328
Pyrogallic acid, 328
Pyrogallol, 328
Pyroxylin, 328
Pyroxylinum, 328

Quantities, determination of, 16
Quantity of Ingredients, 31
Quassia, 328
extract of, 135, 328
fluidextract of, 129, 328
tincture of, 119, 328
Queen's root, 354
Quercus, 329
alba, (Pharm. 1890), 329
fluidextract of, 129, 329
Quevenne's iron, 266
Quicksilver, 279
Quillaja, 329
fluidextract of, 129, 329
tincture of, 117, 329
Quinina, 329
Quininæ bisulphas, 330
disguising of, 42, 43, 44
hydrobromas, 330
hydrobromidum, 330
hydrochloras, 330
hydrochloridum, 330
salicylas, 331
sulphas, 331
Quinine, 329
bisulphate, 330
hydrobromide, 330
hydrochloride, 330
oleate of, 176, 329
salicylate, 331
sulphate, 331
tannate, 42

Rancidity, test for, 180
Recipe, 7, 8
Rectal administration, 60
Rectum, applications to, 54
Red coloring, 41
Reduced iron, 266
Reference list, 193
Resin—continued.
of jalap, 136
of podophyllum, 136
of scammony, 136
of scammony, preparation of, 136
Resina, 331
Resina jalapæ, 136
Resina podophylli, 136
scammonii, 136
Resinae, 136
Resorcin, 332
Resorcinol, 332
Resorcinum, (Pharm. 1890) 332
Rhamnus purshiana, 332
Rhatany, 285
Rheum, 333
Rhubarb, 333
and soda, mixture, 98, 333
extract of, 135, 333
fluidextract of, 129, 333
pills of, compound, 153, 333
powder, compound, 139, 333
syrup of, 86, 333
syrup of, aromatic, 86, 333
tincture of, 119, 333
tincture, aromatic, 119, 333
Rhus glabra, 334
glabra, fluidextract of, 129, 334
Rochelle salt, 324
Roman chamomile, 218
Rosa gallica, 334
Rose, confection of, 150, 334
fluidextract of, 129, 334
honey of, 87, 334
Rose, 334
oil of, 306, 334
red, 334
syrup of, 85, 334
water, 78, 334
water, ointment of, 181, 334
water, stronger, 78, 334
water, triple, 78, 334
Rosemary, oil of, 306
Rosin, 331
cerate, 184, 332
cerate compound, 184, 332
Rubber, 257
Rule, Cowling's, 24
Young's, 24
Rules for abbreviation, 14
for number of doses in day, 30

Digitized by Google

Rhubus, 334
fluidextract of, 129, 335
syrup of, 86, 335
Rye, ergot of, 257
spurred, 257

Sabal, 335
Sabina, 335
Saccharated citric acid, 147
ferrous carbonate, 260
sodium bicarbonate, 147
tartaric acid, 147
Saccharin, 228, 43
Saccharum, 335
Saffron tincture of, 41
Safrol, 336
Safrolum, 336
Sage, 336
Saigon cinnamon, 247
Salicin, 336
Salicinum, 336
Salicylate, ammonium, 216
eserine, 315
lithium, 289
methyl, 295
phenyl, 314
physostigmine, 315
quinine, 331
sodium, 350
strontium, 355
Salicylic acid, 202
Salol, (Pharm. 1890) 314
Salts, names of, 10
Salvia, 336
Sandalwood, oil of, 307
Sanguinaria, 336
fluidextract of, 129, 336
tincture of, 116, 336
Santal, oil of, 307
Santalum rubrum, 337
Santonica, 337
Santonin, 337
Santoninum, 337
Sapo, 338
mollis 338
Sarsaparilla, 338
fluidextract of, 129, 339
fluidextract of, compound, 129, 339
syrup of compound, 85, 339
Sassafras, 339
medulla, 339
oil of, 339
oil of, synthetic, 336
pith, 339
pith, mucilage of, 88, 339
Saunders, red, 337
Savin, 335
fluidextract of, 129, 335
oil of, 335
Saw palmetto, 335
Scammonium, 339
Scammony, 339
resin of, 136, 340
Scilla, 340
Scoparius, 340
Scopola, 340
extract of, 135, 341
fluidextract of, 129, 341
Scopolamine hydrobromide, 341
Scopolaminæ hydrobromidum, 341
Scutellaria, 341
fluidextract of, 129, 341
Secret medicines, 68, 70
Seidlitz powder, 139
Senega, 341
fluidextract of, 129, 342
snakeroot (senega), 341
syrup of, 87, 342
Senna, 342
compound infusion, 111, 342
confection of, 150, 342
fluidextract of, 129, 342
syrup of, 87, 342
Serpentaria, 342
fluidextract of, 129, 342
tincture of, 119, 342
Serum, antidiphtheriticum, 343
Sevum, (Pharm. 1890) 343
praeparatum, 343
Shot-gun prescription, 36
Signature, 45
Silver-coating, 155
cyanide, 220
nitrate, 220
nitrate, diluted, 221
nitrate, fused, 221
nitrate, mitigated, 221
oxide, 221
Simple cerate (ceratum), 184
elixir (Elixir aromaticum) 94
Simplicity in prescribing, 36
Sinapis alba, 344
nigra, 344
Skullcap (Scutellaria), 341
Slippery elm, 363
Snakeroot, black, 245
senega, 341
Virginia, 342
Soda water, 74
Soap, 338
bark (quillaja), 329
green (sapo mollis), 338
green, tincture of (linimentum saponis mollis), 175

Digitized by Google

Soap—continued
liniment, 174
plaster, 189
soft, 338
soft, liniment of, 175
white castile (sapo), 338
Soda caustic, 348
chlorinated, solution of, 80
solution of, 80, 348
Sodii acetas, 344
arsenas, 345
arsenas exsiccatus, 345
benzoas, 345
bicarbonas, 345
bicarbonas saccharatus, 147
bisulphis, 346
boras, 346
bromidum, 346
carbonas monohydratus, 347
chloras, 347
chloridum, 347
citras, 347
hydroxidum, 348
hypophosphis, 348
hyposulphis, 351
iodidum, 348
nitras, 348
nitris, 348
phenolsulphonas, 349
phosphas, 349
phosphas effervescens, 146 350
phosphas exsiccatus, 350
pyrophosphas, 350
salicylas, 350
sulphas, 350
sulphis, 351
sulphocarbolas, 349
thiosulphas, 351
Sodium acetate, 344
arsenate, 345
arsenate, exsiccated, 345
arsenate, solution of, 82, 345
benzoate, 345
bicarbonate, 345
bicarbonate, saccharated, 147
bicarbonate, troches, 159, 346
bisulphite, 346
borate, 346
bromide, 346
carbonate, 347
carbonate, monohydrated, 347
chlorate, 347
chloride, 347
citrate, 347
hydrate, 348
hydroxide, 348
hydroxide, solution, 80, 348
hypophosphite, 348
Sodium—continued.
hyposulphite, 351
iodide, 348
nitrate, 348
nitrite, 348
phenolsulphonate, 349
phosphate, 349
phosphate, compound solution of, 350
phosphate, effervescent, 146, 350
phosphate, exsiccated, 350
pyrophosphate, 350
salicylate, 350
sulphate, 350
sulphite, 351
sulphocarbolate, 349
thiosulphate, 351
Soft soap, 338
soap, liniment of, 175
Solubility, generalizations on, 74
Solute, 74
Solution of ammonium acetate, 80
of ammonium acetate, preparation, 81
antiseptic, 83
of arsenous acid, 81
of arsenous and mercuric iodides, 82
of basic ferric sulphate, 82
of calcium hydroxide, 80
of chlorinated soda, 80
of chlorine, compound, 80
of cresol, compound, 83
Donovan's, 82
of ferric chloride, 82
of ferric subsulphate, 82
of ferric sulphate, 82
of formaldehyde, 83
of hydrogen dioxide, 78, 220
of hydrogen peroxide, 78, 220
of iodine, compound, 80
of iron and ammonium acetate, 82
Labarraque's, 80
lead subacetate, 82
of lead subacetate, diluted, 82
Lugol's, 82
of magnesium citrate, 81
of mercuric nitrate, 82
Monsel's, 82
of potassa, 80
of potassium arsenite, 81
of potassium citrate, 81
of potassium hydroxide, 80
of soda, 80

Digitized by Google

Solution—continued.
of sodium arsenate, 82
of sodium hydroxide, 80
of sodium phosphate, compound, 81
of zinc chloride, 83
Solutions, 79
alcoholic, 89
aqueous, 76
glycerin, 95
saturated, 74
Solvent, 74
Spanish flies, 238
Sparteinæ sulphas, 351
Sparteine sulphate, 351
Spearmint, 295
oil of, 295
spirit of, 91, 295
water, 78, 295
Species, 148
laxatives, 149
pectorales, 149
Specifying in prescriptions, 67
Spermaceti, 241
Spigelia, 352
fluidextract of, 129, 352
Spirit of ammonia, 91
of ammonia, aromatic, 91
of ammonia, aromatic, preparation of, 92
of anise, 90
of bitter almond, 90
of camphor, 90
of chloroform, 91
of cinnamon, 90
of ether, 91
of ether, compound, 91
of gaultheria, 90
of glonoin, 91, 353
of glyceryl trinitrate, 91, 353
of juniper, 90
of juniper, compound, 91
of lavender, 91
of Mindererus, 80
of nitre, sweet, 91, 352
of nitroglycerin, 91, 353
of nitrous ether, 91, 352
of orange compound, 90
of peppermint, 91
of spearmint, 91
of wintergreen, 90
Spirits, 90
aromatic, 90
chemical, 91
Spiritus—continued.
ammoniae aromaticus, preparation of, 92
amygdalae amarae, 90
anisi, 90
aurantii compositus, 90
camphorae, 90
chloroformi, 91
cinnamomi, 90
frumenti, 90
gaultheriae, 90
glonoini, (Pharm. 1890), 353
glycerylis nitratis, 91, 353
juniperi, 90
juniperi compositus, 91
lavandulae, 91
menthae piperitae, 91
menthae viridis, 91
vini gallici, 91
Spray, 50
Spurred rye, 257
Squill, 340
fluidextract of, 129, 340
syrup of, 86, 340
syrup of, compound, 87, 340
tincture of, 116, 340
vinegar of, 132, 340
Standardization, 109
Staphisagria, 353
fluidextract of, 353
Starch, 218
corn, 218
glycerite of, 96, 218
Stavesacre, 353
Steam inhalation, 51
Stearate, zinc, 368
zinc ointment of, 182, 368
Stearic acid, 203
Sterilization of hypodermic solution, 64
Stillingia, 354
fluidextract of, 129, 354
Stomach, administration for action on, 53
Storax, 357
Stramonium, 354
extract of, 135, 354
fluidextract of, 129, 354
leaves, 354
ointment, 182, 354
tincture of, 116, 354
Strontii bromidum, 354
iodidum, 355
salicylas, 355

Digitized by Google

Strychninae nitras, 356
sulphas, 357
Strychnine, 356
nitrate, 356
sulphate, 357
Styrax, 357
Subacetate lead, cerate of, 184
lead, diluted solution of, 82
lead, solution of, 82
Subarachnoid injection, 58
Subcarbonate bismuth, 229
Subchloride of mercury, 277
Subcutaneous administration, 63
Subgallate, bismuth, 230
Sublimate, corrosive, 276
Sublimed sulphur, 358
Subnitrate bismuth, 230
Subsalicylate, bismuth, 230
Subscription, 6, 45
Subsulphate, ferric, solution of, 82
Succedanea, 25
Suet, prepared, 343
Sugar, 335
cane, 335
of lead, 319
of milk, 336
Sulphate aluminum, 213
aluminum and potassium, 212
ammonio-ferric, 262
atropine, 234
basic ferric, solution of, 82, 265
calcium, dried, 234
calcium, exsiccated, 234
cinchonidine, 246
cinchonine, 246
codeine, 250
copper, 255
eserine, 316
ferric, solution of, 82, 265
ferric ammonium, 262
Sulphate, ferrous, 265
ferrous, dried, 265
ferrous, exsiccated, 265
ferrous, granulated, 265
hyoscyamine, 281
magnesium, 291
magnesium effervescent, 146, 291
manganese, 292
morphine, 298
physostigmine, 316
potassium, 327
quinine, 331
sodium, 350
sparteine, 351
strychnine, 357
zinc, 368
Sulphide, calcium, crude, 236
Sulphite, sodium, 351
Sulphocarbolate zinc, 368
Sulphocarbolate sodium, 349
Sulphonal, 358
Sulphonethylmethane, 357
Sulphonethylmethanum, 357
Sulphonmethane, 358
Sulphonmethanum, 358
Sulphur, flowers of, 358
iodide, 359
lotum, 358
ointment, 182, 358
praecipitatum, 359
sublimatum, 358
washed, 358
Sulphurated lime, 236
Sulphuric acid, 203
acid aromatic, 204
acid, diluted, 204
Sulphuris iodidum, 359
Sulphurous acid, 204
Sumbul, 359
extract of, 135, 359
fluidextract of, 129, 359
Superscription, 6
Suppositoria, 168
glycerini, 169
Suppositories, 54, 168
aural, 169
of glycerin, 169
nasal, 169
rectal, 169
vaginal, 169
urethral, 169
Suppository capsules, 171
Suprarenal glands, desiccated, 269
Sweet flag, 232
Sydenham's laudanum, 125, 310
Synergist, 27
Synonym, 10
Syrup, 85
of acacia, 85
of almond, 85
of calcium hydroxide, 86
of calcium lactophosphate, 86
of citric acid, 85
of ferrous iodide, 86
of ginger, 86
hive, 87
of hydriodic acid, 86
of hypophosphites, 86
of hypophosphites, compound, 86
of ipecac, 86
of krameria, 86
of lactucarium, 86
of lime, 86

Digitized by Google

Syrup—continued.
of orange, 85
of orange flowers, 85
of orange flowers, preparation of, 84
of the phosphates of iron, quinine and strychnine, 86
of rhubarb, 86
of rhubarb, aromatic, 86
of rose, 85
of rubus, 86
of sarsaparilla, compound, 85
of senega, 86
of senna, 87
of squill, 86
of squill, compound, 87
of tar, 86
of tolu, 85
of wild cherry, 86
Syrups, 83
flavoring, 85
medicated, 86
Syrupus, 85
acaciae, 85
acidi citrici, 85
acidi hydriodici, 86
amygdalae, 85
aurantii, 85
aurantii florum, 85
calcii lactophosphatis, 86
calcis, 86
ferri iodidi, 86
ferri, quininae et strychninae phosphatum, 86
hypophosphitum, 86
hypophosphitum compositus, 86
ipecacuanhae, 86
krameriae, 86
lactucarii, 86
picis liquidae, 86
pruni virginianae, 86
rhei, 86
rhei aromaticus, 86
rosae, 85
rubi, 86
sarsaparillae compositus, 85
scillae, 86
scillae compositus, 87
senegae, 87
sennae, 87
tolutanus, 85
zingiberis, 86

Tabella saturatio, 162
trituratio, 161
Tabellae, 160
hypodermicae, 163
Table of prices, 71
Tablet, hypodermic, 163
saturate, 162
triturate, 161
Tablets, 160
Talc, 360
purified, 360
Talcum, 360
purificatum, 360
Tamarind, 360
Tamarindus, 360
Tannic acid, 205
acid, glycerite of, 96, 205
acid, ointment of, 180, 205
acid, troches of, 159, 205
Tannin, 205
Tar, 318
juniper, oil of, 302
oil of, 319
ointment of, 182, 319
syrup of, 86, 319
Taraxacum, 360
extract of, 135, 360
fluidextract of, 129, 360
Tartrated antimony, 218
Tartar, cream of, 322
emetic, 218
Tartaric acid, 206
Tartrate, antimony and potassium, 218
iron and ammonium, 262
iron and potassium, 263
potassium and sodium, 324
Tea St. Germain, 149
Teas, 148
Terebene, 360
Terebenum, 360
Terebinthina, 361
Canadensis, 361
Terpin hydrate, 361
Terpini hydras, 361
Theine, 232
Therapeutics defined, 4
Therapeutic incompatibility, 44
Thiosulphate, sodium, 351
Thoroughworth, 259
Thyme, oil of, 308
Thymol, 361
iodide, 362
Thymolis iodidum, 362
Thyroid glands, desiccated, 270
Time and frequency of administration, 29
Tinctura aconiti, 115
aloes, 117
aloes et myrrhae, 117
arnicae, 117
asafoetidae, 117
aurantii amari, 118
aurantii dulcis, 118

Digitized by Google

Tinctura—continued.
belladonnae foliorum, 115
benzoini, 117
benzoini composita, 117
calendulae, 118
calumbae, 118
cannabis indicae, 116
cantharidis, 116
capsici, 116
cardamomi, 118
cardamomi composita, 118
cimicifugae, 118
cinchonae, 118
cinchonae composita, 118
cinnamomi, 117
colchici seminis, 116
croci, 41
digitalis, 116
ferri chloridi, 116
gallae, 118
gambir composita, 118
gelsemii, 116
gentianae composita, 118
gentianae, preparation of, 120
guaiaci, 118
guaiaci ammoniata, 118
hydrastis, 118
hyoscyami, 116
iodi, 116
ipecacuanhae et opii, 116
kino, 119
krameriae, 119
lactucarii, 117
lavandulae composita, 117
limonis corticis, 119
lobeliae, 116
moschi, 119
myrrhae, 117
nucis vomicae, 116
opii, 116
opii, preparation of, 121
opii, assay of, 122
opii camphorata, 119
opii deodorati, 116
persionis, 41
persionis composita, 41
physostigmatis, 116
pyrethri, 117
quassiae, 119
quillajae, 117
rhei, 119
rhei aromatica, 119
sanguinariae, 116
scillae, 116
Tinctura—continued.
valerianae ammoniata, 119
vanillae, 119
veratri, 117
zingiberis, 117
Tincturae, 114
herbarum recentium, 119
Tincture of aconite, 115
of aloes, 117
of aloes and myrrh, 117
of arnica, 117
of asafoetida, 117
of belladonna leaves, 118
of benzoin, 117
of benzoin, compound, 117
of bitter orange peel, 118
of calendula, 118
of calumba, 118
of cantharides, 116
of capsicum, 116
of cardamom, 118
of cardamom, compound, 118
of catechu, compound, (gambic compound), 118
of cimicifuga, 118
of cinchona, 118
of cinchona, compound, 118
of cinnamon, 117
of colchicum seed, 116
of deodorized opium, 116
of digitalis, 116
of ferric chloride, 116
of gambir, compound, 118
of gelsemium, 116
of gentian, compound, 118
of gentian, preparation of, 120
of ginger, 117
of green soap (linimentum saponis mollis), 175
of guaiac, 118
of guaiac, ammoniated, 118
of hydrastis, 118
of hyoscyamus, 116
of Indian cannabis, 116
of iodine, 116
of ipecac and opium, 116
of kino, 119
of krameria, 119
of lactucarium, 117
of lavender, compound, 117
of lemon peel, 119
of lobelia, 116
of musk, 119
of myrrh, 117

Digitized by Google

Tincture—continued.
of opium camphorated, 119
of physostigma, 116
of pyrethrum, 117
of quassia, 119
of quillaja, 117
of rhubarb, 119
of rhubarb, aromatic, 119
of sanguinaria, 116
of serpentaria, 119
of squill, 116
of stramonium, 116
of strophanthus, 117
of sweet orange peel, 118
of tolu, 117
of valerian, 119
of valerian, ammoniated, 119
of vanilla, 119
of veratrum, 117
Tinctures, 114
of fresh herbs, 119
Tolu, balsam of, 226
coating, 155
syrup of, 85, 226
tincture of, 117, 226
Topical application, 47
Tragacanth, 362
mucilage of, 88, 362
Tragacantha, 362
Transcription, 45
Transcription defined, 6
Trichloracetic acid, 206
Trinitrate, glyceryl, spirit of, 353
Trional, 357
Trioxide, arsenic, 222
chromium, 244
Triticum, 363
fluidextract of, 129, 363
Triturates, 143
Trituratio elaterini, 144
Trituration of elaterin, 144
Triturationes, 143
Triturations, 143
Troches, 158
list of, 159
Trochisci, 50, 158
list of, 159
Troy weight, 17
Tully's powder, 139
Turpentine, 361
Canada, 361
liniment, 175
oil of, 307
oil of, emulsion of, 100, 307
oil of, rectified, 307

Ulmus, 363
Ultramarine, 41

Unguenta, 179
list of, 180
Untoward effects, 26
Unusually large doses, 27
expensive medicine, 71
Urethral injection, 55
Uva ursi, 363
ursi, fluidextract of, 129

Vaginal applications, 56
Valerate, ammonium, 216
zinc, 369
Valerian, 363
fluidextract of, 130, 364
tincture of, 119, 364
tincture of, ammoniated, 119, 364
Valeriana, 363
Valerianate, ammonium, 316
Vallet's mass, 149
Vanilla, 364
tincture of, 119, 364
Vanillin, 364
Vanillinum, 364
Vapor inhalation, 52
Vegetable cathartic pills, 152
Vehicle, 37
Veratrina, 364
Veratrine, 364
ointment, 182, 365
oleate of, 177, 365
Veratrum, 365
fluidextract of, 130, 365
tincture of, 117, 365
viride (veratrum), 365
Verbs, 8
Viburnum (viburnum prunifolium), 365
Viburnum opulus, 365
opulus, fluidextract of, 130, 365
Viburnum prunifolium, 365
prunifolium, fluidextract of, 130, 365
Vichy salt, artificial effervescent, 147
Vinegar of opium, 132
Vinegar of squill, 132
Vina, 124
list of, 125
Virginia snakeroot, 342
Volatile liniment, 174
oil of mustard, 344

Wahoo, 259
Wash, black, 173
lead and opium, 173
yellow, 173
Washes, 172

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